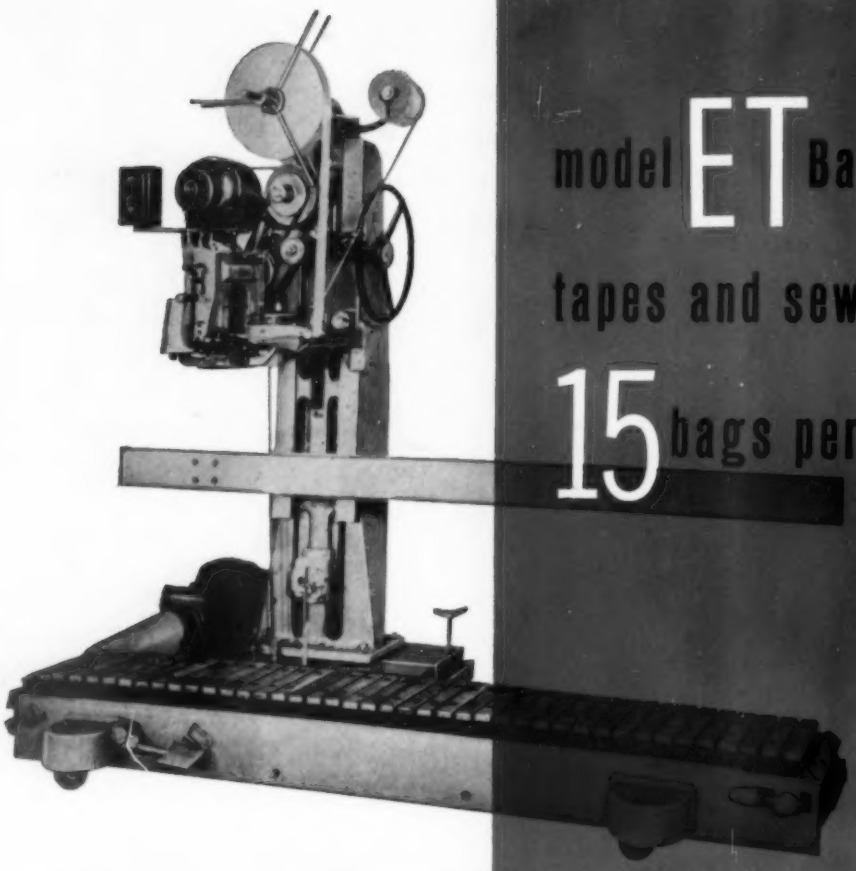
For producers of Sand and Gravel, Crushed Stone, Cement, Lime, Gypsum, and other nonmetallic minerals

SEPTEMBER 1955

PIT and QUARRY

Table of Contents, Page 2

Aerial View of Canadian Johns-Manville's Munro Mine Near Matheson, Ont. (See Page 74.)



model ET Bagpaker®

tapes and sews 15 bags per minute

TAKE ADVANTAGE OF THESE 5 MODEL ET BAGPAKER FEATURES:

- One operator finishes 15 bags a minute when filled bags are delivered continuously to the conveyor
- Adjusts to bags from 25 to 100 lb. capacity
- Caster-mounted, the Model ET is easily moved to widely separated packaging stations
- Bag starts and stops sewing head when equipped with automatic sewing head control
- Automatic brake on Hoepner No. 150 Heavy Duty sewing unit prevents "coasting"

Here's the perfect teammate for your present filling and weighing equipment—the most efficient way to get better protection and faster packaging at the lowest possible cost.

Here's how the Model ET Bagpaker works: One operator receives bags from your weighing and filling machine. In four seconds or less the Bagpaker has applied creped "kraft" sealing tape over the bag end, sewn a reinforced "cushion stitch" through both tape and bag, and trimmed the tape. You can't beat that for efficiency and speed.

Booklet ET gives you complete details and dimensional drawings, shows you how perfectly Model ET fits into your existing filling set-up. There's no obligation—just write to: Dept. D-16.

International Paper Company, Bagpak Division
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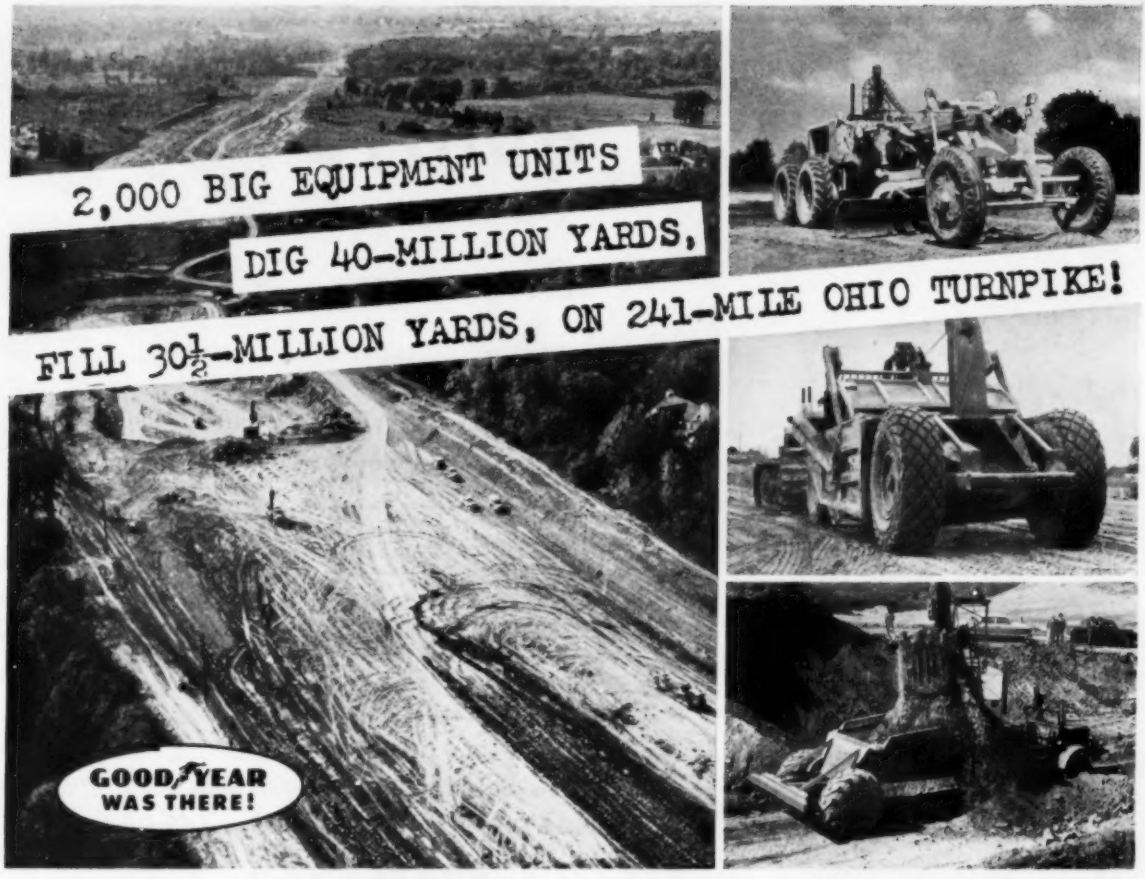

Soon to be humming to the tune of 39,000 vehicles a day, Ohio's new 241-mile toll road, of twin 24-foot pavements on 200 foot right of way, is taking less than 3 years from start to finish! This fast-stepping 20-hour-a-day pace is maintained by equipment drawn from all over the country—much of it rolling on Goodyear earth-mover and off-road tires built with 3-T NYLON Cord.

Look for this sign; there's a Goodyear dealer near you

YOU set the pace—
TIRES OF 3-T NYLON CORD CAN TAKE IT!

Tires built with Goodyear's *exclusive*-process 3-T NYLON Cord have been on the toughest, fastest-moving jobs for almost 2 years. In that time, they've proved themselves *the greatest moneysavers for truckers and contractors in 20 years!* 3-T NYLON CORD keeps bruise breaks and heat blowouts close to the vanishing point, virtually eliminates ply separation and flex failure — keeps tires in shape for many more re-lugs and recaps. If you want to cut your tire-cost-per-job, specify Goodyear 3-T Cord tires—Rayon or Nylon—for everything that rolls!

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Road Lug, Sure-Grip, All-Weather—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

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PIT AND QUARRY IS INDEXED IN THE ENGINEERING INDEX

pit and quarry

THE BASIC MAGAZINE IN A BASIC INDUSTRY

SEPTEMBER 1955—vol. 48, no. 3

Editorial: Automation 10
Washington News Letter 12
News of the Industry 21
Thirty Years Ago in Pit and Quarry 46
Screenings 64
Johns-Manville's Munro Mine—First Asbestos Development in Ontario's "Golden Area" 74
Producer Manufactures Sand to Overcome Fines Deficiency 79
Texas Gravel Producer Adds Crushed Stone Plant 82
Crushed Stone Directors Meet at Hot Springs 93
Helical Gearing for Mill and Kiln Drives 96
Report on Current Labor Developments 101
Consider Tax Angles in Making Management Decisions 106
South Carolina Gravel Plant Designed to Remove Clay and Save Fine Sand 110
Gravel Producer Adds Heavy Media Separation 125
New Nova Scotia Development of National Gypsum Company Allows Year-Round Operation 129
Michigan Gravel Plant Supplies Both Ohio and Indiana Turnpikes 133
Blast Furnace Slag in Agriculture 139
New Law on Machine Patents 158

The Concrete Manufacturer

Editorial: Fire Is Your Business 213
News of the Concrete Industries 215
Pipe Firm Adds Precast Concrete Roof Tile Plant 226
Concrete Wall Panels Cut Labor Costs 230
Walt Keeler Extends Basic Plant Pattern 236
Etymologically Speaking 244

New Machinery 50
More Information Please 103
Legal Decisions 168
Manufacturers' News 177
Index to Advertisers 287

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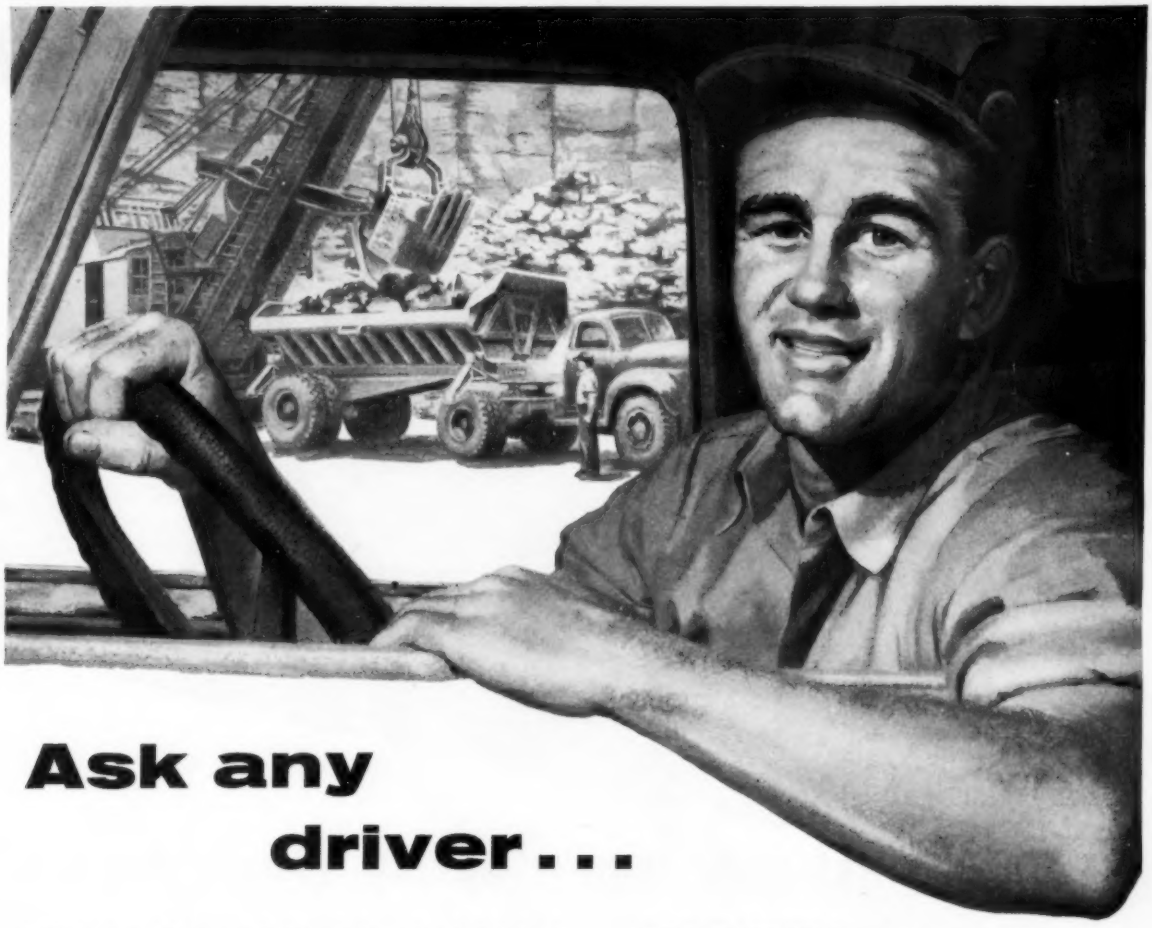
To subscribers: When requesting change of address, kindly send old as well as new address.



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What does the man behind the wheel think of EASTON? Is his opinion significant? Let a typical EASTON driver tell what he thinks...

EASTON has made this kind of driving easy. With EASTON it's straightaway driving all the time...I see where I'm going. I don't have to operate a hoist dumping a load that I can't watch. With EASTON I drive straight in...the overhead hoist takes over while I wait. I drive away in a straight-on loop back to the shovel.

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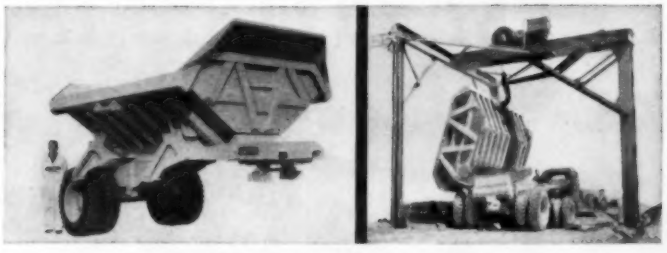
What do I say about dependability? Just this – for steady going through years of the hardest kind of service I'll take EASTON over anything else you want to name.

B-1060

YOU CAN'T BEAT THIS COMBINATION!



It's the famous EASTON doorless pan trailer and exclusive EASTON electric overhead dumping system. Dependable overhead dumping is *essential!* Trailer capacities, 10 to 36 tons.

You are invited to check the above comments with any driver of EASTON trailers. Also, Easton will always welcome an opportunity to make a competitive survey when the aim is to provide a better transportation system for mines or quarries.

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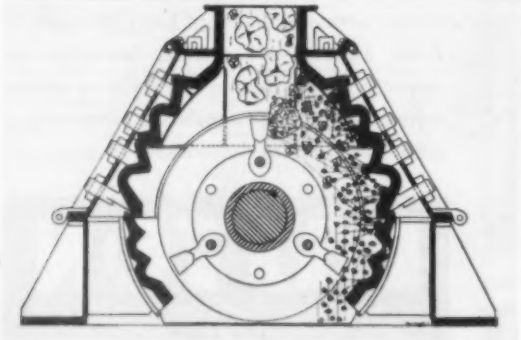
PENNSYLVANIA

REVERSIBLE IMPACTOR

THIS CRUSHER HAS MADE, AND IS MAKING, CEMENT HISTORY

In 1937 Pennsylvania designed, built and installed the first Impactor in a cement plant. From the start of operation it was apparent that this machine would have a definite place in the cement and crushed stone industries, but no one could predict its rapid and universal acceptance. Today one or more Pennsylvania Reversible Impactors are installed in 55 plants of 43 cement companies. As is to be expected, the design is imitated but 24 out of 25 Impactors sold to cement plants are Pennsylvania Impactors. Play it safe, buy a Pennsylvania and be sure of low maintenance costs and a uniform product year after year. Whenever you need help on your crushing problems write Pennsylvania Crusher Division of the Bath Iron Works Corporation, West Chester, Pennsylvania.



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SINGLE ROLLS

PE-195

Another NORTHWEST Model 41 goes to work!

14

THIS MAKES 14 NORTHWESTS for ROWE CONSTRUCTION CO. BLOOMINGTON, ILL.

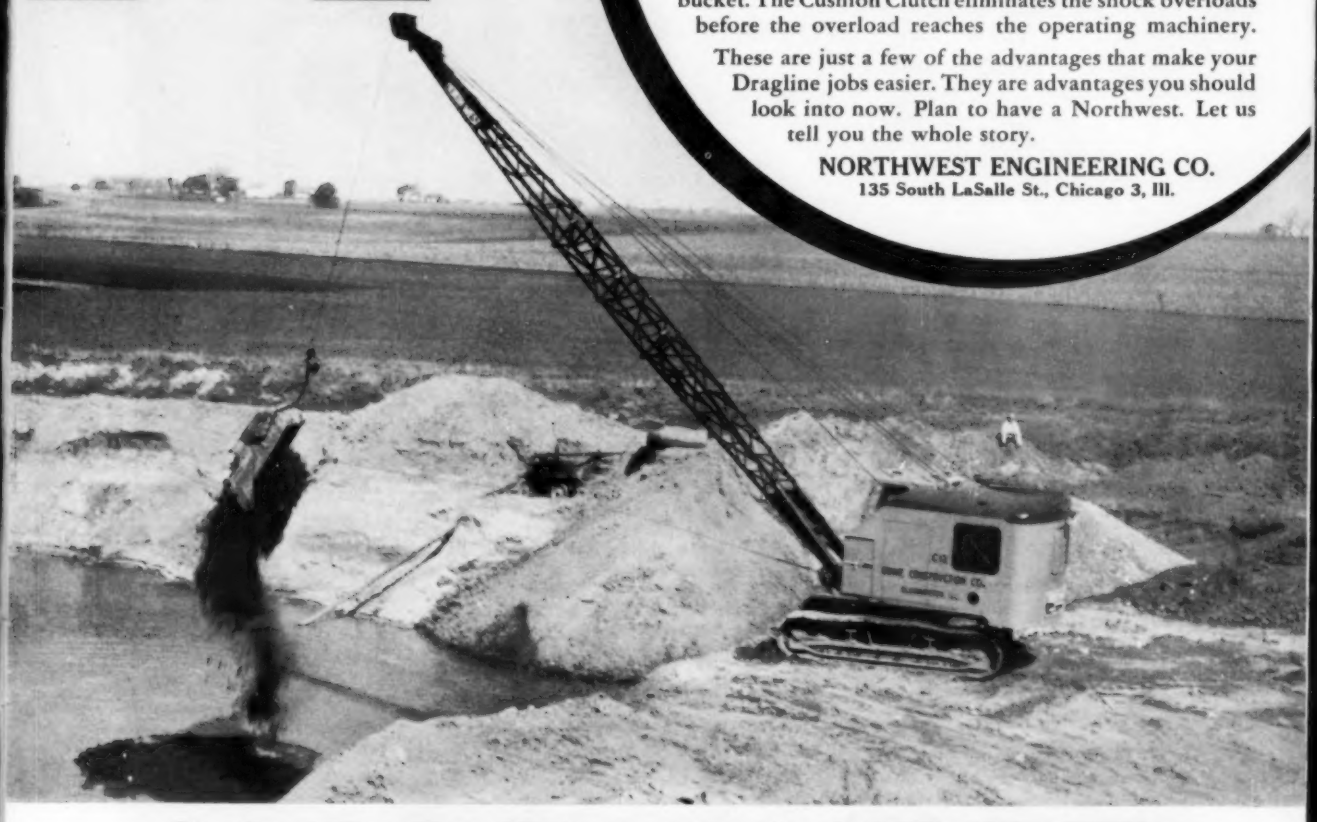
Here is another of the many Northwest Model 41s going to contractors all over the country. This one makes the 14th Northwest bought by Rowe Construction Co. of Bloomington, Ill. Remember, the Model 41 is a full 1 yd. machine built as a 1 yd. from the ground up.

As a Dragline Northwest brings you a combination of advantages that let you get the most out of a job. Northwest Crawlers have been proved in miles of travel and Northwest Steering means easier handling in the rough conditions so often present in dragline work.

The "Feather-Touch" Clutch Control reduces the fatigue of a long day without resorting to complicated, delicate mechanisms. Simplicity of design assures ease of upkeep and reduces down time for adjustment and repair. Uniform Pressure Swing Clutches assure smooth, accurate, fast spotting of the bucket. The Cushion Clutch eliminates the shock overloads before the overload reaches the operating machinery.

These are just a few of the advantages that make your Dragline jobs easier. They are advantages you should look into now. Plan to have a Northwest. Let us tell you the whole story.

NORTHWEST ENGINEERING CO.
135 South LaSalle St., Chicago 3, Ill.



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SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Convertible for any Mining Material Handling or Excavation Problem

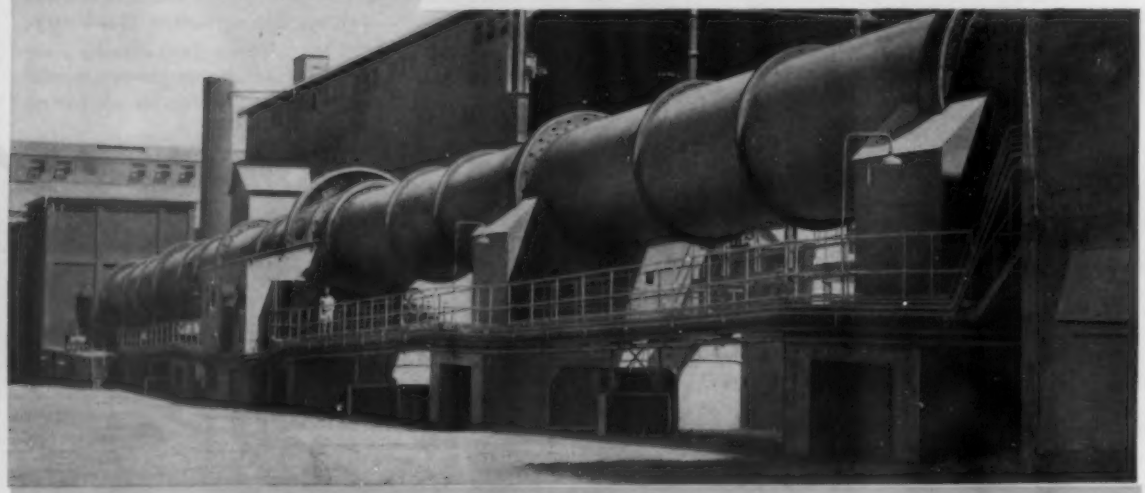
Let's talk EXPANSION

Have You Thought About What Could Be Done to Increase Plant Capacity . . . and Lower Production Costs?

Expansion planning differs from plant to plant. In some operations, meeting increased capacity requirements calls for complete replacement of out-moded equipment.

In other operations, the answer lies in supplementing existing equipment or developing a more efficient flow of materials. Such expansion might call for more grinding or burning capacity. It could require better heat recovery or faster clinker cooling. Maximum fuel utilization, lower power consumption and reduced maintenance are other important considerations.

Regardless of your expansion requirements, Allis-Chalmers engineering assistance and industry-proved equipment can help you provide the desired increase in production at the lowest possible cost.



Allis-Chalmers engineering improvements make the application of the A-C rotary kiln the most efficient method of pyro-processing. Patented heat-recuperating system saves fuel. Air cooled discharge end keeps kiln end round and rigid. True circle, all-welded construction insures best lining fit, long refractory life. Twenty-degree involute spur gears spread driving force equally. Floating-type riding rings provide adequate support and proper weight distribution.

When you call on Allis-Chalmers for assistance, you get the benefit of more than half a century of experience in developing and applying equipment for the cement, mining and rock products industries all over the world. For information contact your nearby A-C sales office or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4724

Kilns, Dryers, Coolers

Grinding Mills

Vibrating Screens

Crushers

Over half of all cement manufactured in the U. S. is processed in Allis-Chalmers equipment.

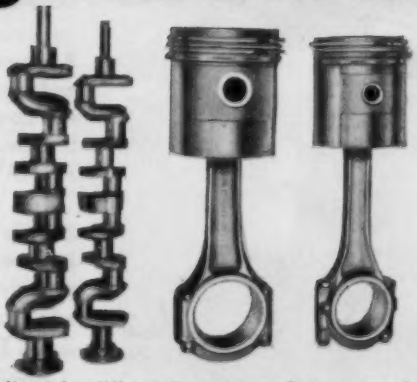
ALLIS-CHALMERS

These Crushing Plants Went Shopping and Saved!

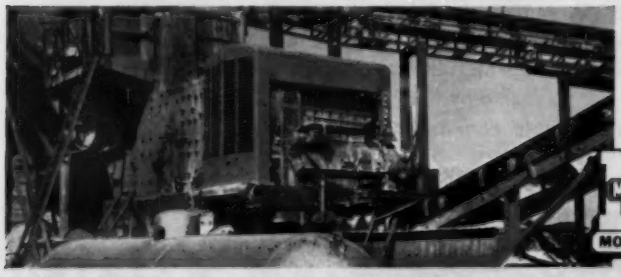
An MM 425-6A LP gas power unit best filled the requirements of this Illinois sand and gravel producer when he went looking for a heavy-duty engine to power roll and jaw crushers. His objective was to get

- **a factory equipped engine for lowest cost fuel**
- **low fuel consumption at maxium power and load**
- **minimum down time and maintenance**
- **convenience of installation and operation.**

The 425-6A more than filled the bill because MM engines are fully and separately designed for gasoline, LP gas, natural gas, diesel, or distillate—MM high turbulence combustion and ample displacement result in high torque at low rpm—long-run features like MM vacuum crankcase ventilation and improved oil filtering require less service—available equipment includes selection of power take-off drives, couplings, rotation and speeds—partial or full enclosures—radiator or cooling coil—choice of location for controls and instruments—electric starter and generator—water-cooled manifolds and heat exchanger jacketed base pan.



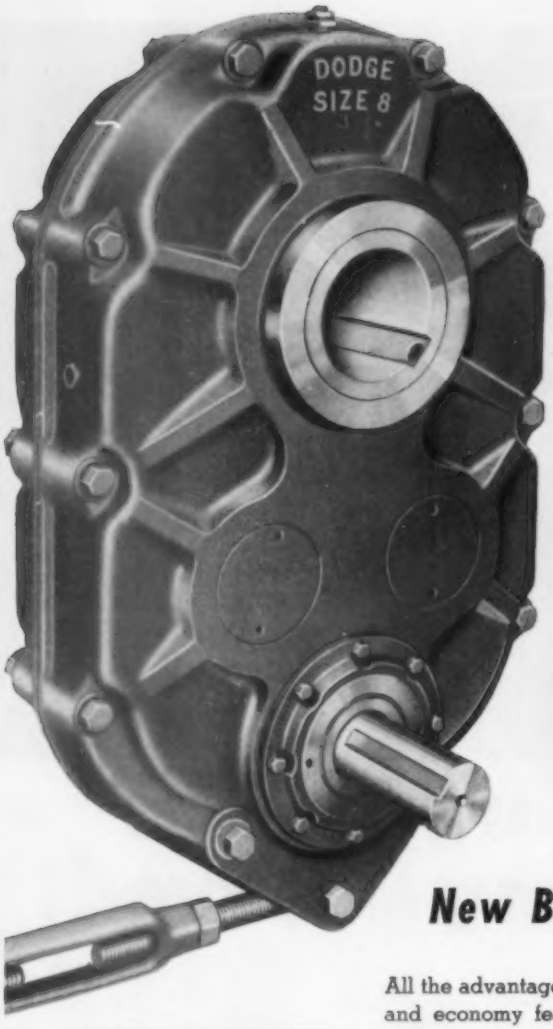
Here is how MM part size goes up as displacement and hp go up to supply heavier construction necessary for continuous heavy load operation. Crankshaft, connecting rod, and piston of MM's 108 hp 605-6A engine are shown side by side with those of the next larger MM engine, the 148 hp 800-6A. Size and weight where it counts does the job longer and without strain.



Minneapolis-Moline engines are available from 29 hp to 291 hp, can be outfitted for specialized applications meeting all original equipment and replacement requirements within size ranges. Specifications and engineering service available on request.

MINNEAPOLIS MOLINE MM MODERN MACHINERY

MINNEAPOLIS-MOLINE
INDUSTRIAL DIVISION
MINNEAPOLIS 1, MINNESOTA



NOW!

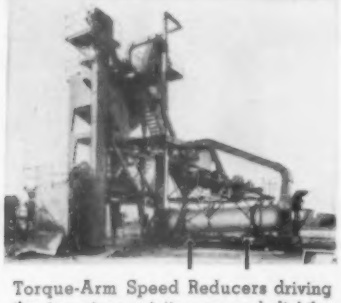
60 H.P. DODGE TORQUE-ARM SPEED REDUCER

New Big Size! New Big Savings!

All the advantages of shaft-mounting . . . all the proven performance and economy features of Dodge Torque-Arm Speed Reducers . . . are now available for your *big* jobs. The husky new size No. 8, in the double reduction series, has a capacity of 60 hp at 100 rpm, AGMA rating, and can be mounted on shafts up to 5-inch diameter.

The new No. 8 has all the inherent advantages of the Dodge Torque-Arm line. No foundation, no flexible couplings, no sliding base required—and there are no lining up difficulties. It is mounted directly on the shaft. The torque-arm, fastened to any fixed object, anchors the reducer. The unit is driven through any V-belt drive. Stock Taper-Lock Sheaves permit any speed ratio desired.

Another new member of the Torque-Arm line is the single reduction No. 11 (1.3 hp at 100 rpm, AGMA rating). Torque-Arm Reducers are now supplied, in both single and double reduction series, with capacities from 1 to 60 hp, output speeds from 12 to 365 rpm. For details write for special Bulletin.



Torque-Arm Speed Reducers driving the trunnions rotating an asphalt kiln.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

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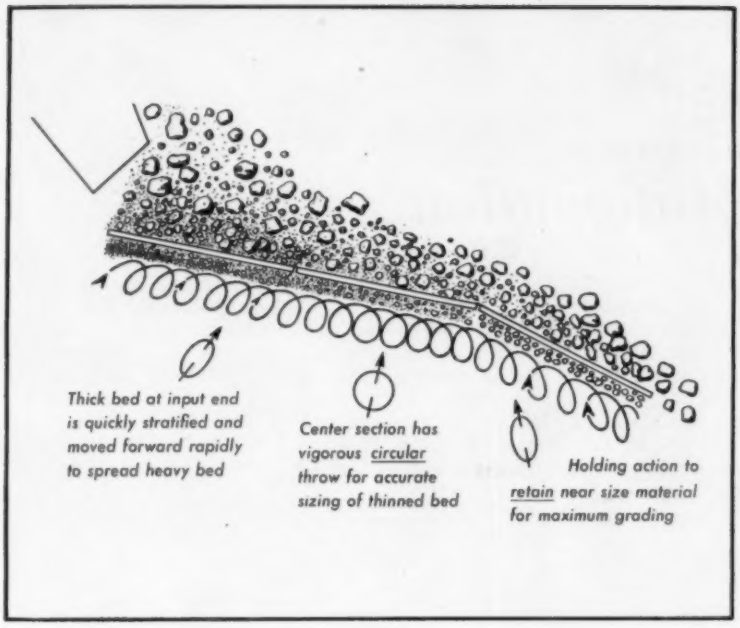
DODGE
of Mishawaka, Ind.


Thick bed at input end is quickly stratified and moved forward rapidly to spread heavy bed
Center section has vigorous circular throw for accurate sizing of thinned bed
Holding action to retain near size material for maximum grading

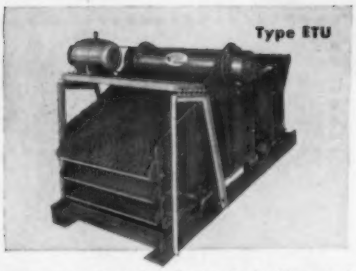
How to select sizing equipment

Most aggregates producers are caught in a three-way squeeze . . . rising production costs . . . more rigid specifications . . . and stiffer competition. It takes the best in screening equipment to meet this challenge . . . big capacity, cost cutting, hard working screens . . . in a size and model selected to do your particular job best. Several leading manufacturers can claim these advantages. But, before you invest, investigate the screen that has all these . . . and many *exclusive* features in addition that make it stand out from all the rest.

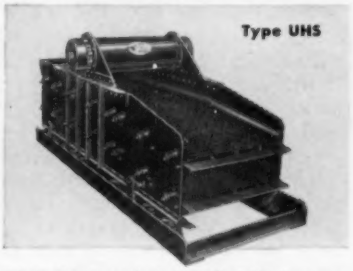
Deister's exclusive "Opposed Elliptical Throw," for example, accurately controls the movement of material on the screen for greatest speed and efficiency in sizing . . . provides more capacity per square foot.

And, don't overlook Deister's exclusive "Unitized Lifetime Vibrating Mechanism." It's a precision-constructed, jig-assembled unit . . . demountable and readily interchangeable. Mounted well above heat, grit and dirt, it features renewable sleeves to prevent wear on bearing housings and shafts, and it operates in a bath of oil.

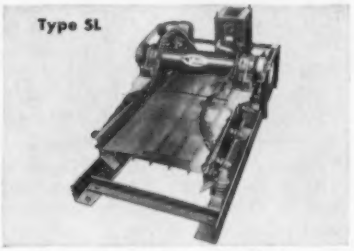
Among others, remember that Deister screens are backed by a follow-through parts and service policy without equal, for Deister top management is personally interested in the continued, profitable operation of every Deister screen in the field.



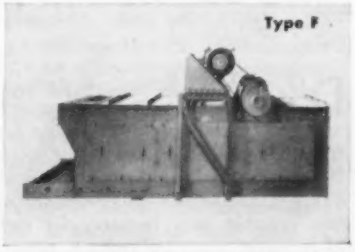
End tension, featuring the longitudinally curved screen surface in combination with the opposed elliptical throw of the Unitized Lifetime Vibrating Mechanism, available in 1 to 4 decks, from 2½' x 4' to 5' x 10'.



Side tension screen featuring adjustable slope panels. Divided screening sections, identical in size, permit shifting to distribute wear. 1, 2 or 3 decks in sizes up to 6' x 16'.



Ag-lime screen . . . handles fine, damp materials at high capacity without blinding because of much longer stroke, higher speed and with graduated stroke feature.



Horizontal screen for installations with low headroom. Features the Deister drop-deck, providing greater screening area for the critical sizes.

DEISTER MACHINE COMPANY

1933 East Wayne Street, Fort Wayne 4, Ind.

The Editor's Page

Automation

AUTOMATION is a word which is widely misunderstood, apparently especially by factory workers. Judging from the statements made by some labor leaders, automation is a Frankenstein's monster of wheels, electricity, and control boxes which is going to create mass unemployment by replacing the worker in the factory. Actually, this is just another "bogeyman", a fresh effort to fool people into fearing and resisting technological progress. The last such effort was by the "technocrats" back in the 1930's. They were proved wrong then, but the same arguments are now being used in another attempt to prove that technological progress will create serious unemployment.

The "threat" of automation currently is one of the major excuses for demands for a guaranteed wage to prevent unemployment. It is in fact becoming a pretext for a full range of welfare state demands, the argument being that mass purchasing power must be increased if automation is to be kept from causing overproduction.

ACTUALLY "automation" is only another word for mechanization and for more technological progress. It is an evolutionary rather than a revolutionary process. Few of us realize that the biggest steps toward automation have already been taken over a period of many years. Mechanization has already almost reached the limit of its possibilities in many industries, providing for automatic production, handling, and processing. What remains to be done in order to achieve actual automation is to further improve all manufacturing operations and to extend automatic operation into control, testing, packaging, etc. When a product can move throughout the entire range of treatment from raw material to packaged finished product in one uninterrupted mechanical flow, then full automation—a complete "pushbutton" factory—will have been achieved.

According to authorities, such a fully-automatic factory is many years away, and in some industries it will never be achieved.

DO machines actually destroy jobs and create unemployment? The facts prove otherwise. Between 1850 and 1953 the population of the United States increased from 23,000,000, to 161,000,000, or roughly seven times. Production, adjusted to today's prices, went up from $12,000,000,000 to $308,000,000,000, or 25 times. This was possible only because the extent of mechanization of industry went up from 6 percent in 1850 to 94 percent in 1953. That the workers did not suffer in this transition is evident from the fact that, while the population multiplied itself seven times, the number of workers increased from 7,500,000 to 67,000,000, a ninefold increase. It is evident from the above that mechanization and our modern way of life cause jobs to increase faster than population or machines.

Instead of being a menace to labor, machines and mechanization are actually responsible for the high standard of living in this country and the ideal conditions under which labor works. Only 150 years ago the average man was a drudge who toiled a lifetime at a rate of pay which barely provided for subsistence. Today the standard of living of the average worker in this country is the envy of the rest of the world. Automation will further increase the dignity of labor by relieving workers of boring, routine jobs. The work week will be further reduced and income increased. There will be more, better, and new products, and they will be cheaper. Higher incomes and more leisure will stimulate participation in sports, hobbies, travel, and cultural activities; this trend will, incidentally, create many new jobs.

ALTHOUGH labor in general, including many labor leaders, is suspicious of further mechanization, some are farsighted enough to be fully aware of the inevitability of further progress. The late Phillip Murray once said when addressing the CIO as its president in 1951 —"I do not know of a single solitary instance where a great technological gain has taken place in the United States of America that it has actually thrown people out of work. I do not know of it, I am not aware of it, because the industrial revolution that has taken place in the United States in the past 25 years has brought into the employment field an additional 20,000,000 people."

There is more than a possibility that delaying further mechanization of industry would be harmful to our economy. Without more automation and mechanization to increase worker productivity, the American standard of living will drop at least 10 percent before 1960, according to R. C. Sollenberger, executive vice-president of the Conveyor Equipment Manufacturers' Association, in a recent address. The reason he gave is that the population is increasing at a much more rapid rate than the labor force. "Because of these factors," he said, "output per worker must rise about 2 percent per year just to maintain the standard of living."

THERE is no doubt that further technological advances by industry and the industrial development of the atom will cause drastic changes in the lives of many of us. The gradual shift from laboring on production lines to the more skilled work of making and operating "automatic" machines and plants will require new skills on the part of many workers.

But this is what has been going on for the last 15 years or more, and our workers have experienced no great difficulty in adjusting themselves. "Automation" will mean only a little more of the same, and the results will mean a higher standard of living and a better life for all of us.

There has always been in us a resistance to change, a fear of the unknown. New machines and methods have always been distrusted until the facts about them have become widely known. It is up to the employers to point out these facts to their employees.

Walter E. Trauffer

Rock loading at Monticello in California.

Efficiency and Economy in Rock Loading

Loading out broken rock in hydro tunnel approach.

In any rock excavation — mine, tunnel or open-cut — time and experience proves that the Eimco 105 Tractor-Excavator is the most efficient, in terms of speed, capacity and over-all costs.

Let us supply the proof of the efficiency of the Eimco 105 for your rock loading job. With a lifting effort of 38,000 lbs. at the bucket lip the Eimco 105 will dig and load faster than a 2-3 yard boom type shovel. The 105 will achieve the results, needed in these days, for tough competitive bidding.

The Eimco Tractor is designed for this efficiency and economy in rock loading. The operator sits up front where he can see. The Eimco is the easiest of all tractors to operate — only two small handles control all movements of the tractor. This provides greater operator efficiency. The tractor is simple in design and strong in construction for greater economy in maintenance and operation. Clutches never need adjustment. The master clutch has been completely eliminated. The old conventional brakes and clutches in the final drive are eliminated. Torque converters are standard equipment on all Eimco Tractors.

Eimco Tractors with Excavator attachments are showing their superiority in rock jobs all over the world. These machines invite comparison — see them at work, compare them piece by piece. For greatest economy and highest efficiency in loading any material, specify Eimco equipment.

B-138

THE EIMCO CORPORATION

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Washington News Letter

another P&Q exclusive

CONGRESS missed its deadline by a few days, but it finally went home; and, as usual, a good part of official Washington went on vacation. In their final burst of activity, the Congressmen did things designed to make quite a lot of the constituents they would have to see when they got home very happy, but left many others with their hopes unfulfilled.

The problem of a Congressman from a Southern mill district with the $1 per hour minimum wage is probably the extreme example. If he voted against the bill, as he was most likely to do, he performed an unpopular act with the largest number of voters in his district; but he did a sound thing in the view of those who control the centers of power in that district. However, even they do not regard him as an unqualified success since he could not persuade a sufficient number of his Congressional colleagues to make his view prevail.

On the other hand, if he voted for the bill he may have earned the eternal enmity of the community's most influential citizens while gaining only a small measure of gratitude from the least articulate of his constituents. While wanting higher wages for themselves, many Southern workers are quite unsure about the overall wisdom of a salary increase. This insecurity stems from a feeling that this measure may slow down or halt the South's unprecedented recent growth, some of which at least has been at the expense of other parts of the country.

Thus, regardless of whether he voted "Yea" or "Nay" on this hard fought issue, he must go home to face an uncertain electorate. And this is not the only issue which would place him in that uncomfortable position.

Congress and the Construction Industry

In a narrower but not unimportant segment of the constituency, namely, those who are part of, or related to, the construction industry, Congressmen have to report both good and bad news.

The principal item of good news is that Congress has appropriated almost $2,000,000,000 for military construction, which is almost 25 percent more than was appropriated last year. Most of this will be spent in the Southern and Western parts of the country; some will be spent overseas in Europe and the Pacific islands.

The principal item of bad news deals with the road building program which became this Congress' major political football. It was put into play early in the game by the Republicans and was rapidly advanced by several forward passes. But, as so often happens, someone fumbled on the financing method and somehow the ball ended up in the hands of the other team. It didn't stay there long when everybody jumped on it, downing it thoroughly. The goal line was still in sight but the game was over. No highway construction program came out of this session of Congress. Credit for this fiasco has been assigned to a large number of lobbies. The dust around this one has not fully cleared yet, but, there is a strong feeling around Washington that the proposed highway construction program may have to be cut down in size before real headway can be made.

Although it is none of their doing, homecoming Congressmen are being asked to explain the reason for the crack-down on home building financing just when the industry was tapering off anyway. Without being privy to the inner councils of the Treasury Department and the Federal Reserve Board, they are having a tough time with that one.

Inflation Fears Again

While many government officials left town to enjoy a short "season in the sun," they left behind a small group of "worriers" who have devoted most of their energies to worrying about inflation.

While most of the economists around Washington can not find any real evidence that inflation is upon us or even imminent, the worriers have become alarmed by the recent large wage increases, and particularly the recent price increase in steel. Rightly or wrongly, the policy makers have followed the worriers and a series of measures designed to put a halt to inflationary tendencies have been instituted. They include raising the interest rate on short-term government securities, raising the Federal Reserve rediscount rate, raising margin requirements, and tightening up on home mortgage terms by both raising the interest and reducing the length of the repayment period.

Why the latter was necessary when home building starts are falling off and defaults on mortgages are not rising is still shrouded somewhat in mystery. The prevailing theory is that home building was the "innocent bystander who got shot" in the latest anti-inflation raid. Mortgages are the principal remaining credit instruments over which the government can exercise direct control. Since this was the only direct tool available it was used even though it may not have been the perfect one, or even the right one, to accomplish the desired purpose.

It also appears possible that the monetary authorities wanted to avoid expanding the total amount of credit outstanding later in the year when the seasonal demand always rises. Thus, they squeezed home buying so that there would be a greater proportion of the available credit around to meet the other needs. If this is so, some of the prosperity of the home building industry was sacrificed to what the worrier conceived to be the general welfare.

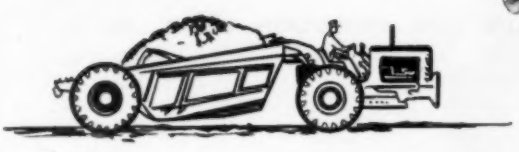
This tightening up of credit is always a risky business. It was done in 1953, with results which are now recognized to have been too drastic. Will the money managers be able to play with a lighter touch this time? This is the mystery of 1955-56. The end of the story may not be known until the votes are counted next November.

Lefferts Named Sec.-Treas. Of Penn-Dixie; Kilian Retires

Robert W. Lefferts has been elected secretary-treasurer of Penn-Dixie Cement Corporation to succeed George Kilian, who is retiring as secretary-treasurer of the company or its predecessor after 47 years.

Mr. Lefferts, who has been controller of Penn-Dixie since 1950, was with Price, Waterhouse & Co. prior to that time. Mr. Kilian has been associated with the cement industry for over 50 years. He was secretary-treasurer of Dixie Portland Cement Company in Chattanooga, Tenn., from 1908 until that company formed part of the merger by which Penn-Dixie Cement Corporation was created in 1926. He has been secretary-treasurer of Penn-Dixie since its inception, and is a past chairman of the audit committee of the Portland Cement Association.

Southern Tire Retreads
Equal Original Mileage
Cut Tire Costs
40% or more!



Superior three-sectional molds enable Southern Tire Company to retread any tire, regardless of growth, without buffing to the breaker strips. This, plus use of the finest rubber made, assures a retread that will equal the mileage of the brand new tire—at a saving of 40% or more!

NO EQUIPMENT DOWNTIME

Your tires will be picked up at your job site after work hours and replaced with spares. Retreads will be replaced after work hours, so there's no costly equipment downtime in the whole operation.

CHOICE OF ROCK SERVICE, TRACTION TYPES, OR RIB TREADS TO SUIT YOUR PARTICULAR JOB.

ALL SIZES from 1100x24 to 2700x33 also new sizes 29.5x25 and 29.5x29.

Call Your Favorite Dealer and Specify Southern Retreads.

Lugs of all Southern Retreads have as much rubber as a new tire, and more undertread than any rock service tire

Southern Tire Company is one of the nation's oldest large tire retreaders, with more retreads to its credit than any other company

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ALABAMA ROAD BUILDERS ASSOCIATION INC. 1947

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A Show you'll never forget!

GENERAL MOTORS POWERAMA

Gala Celebration of the 100 Millionth GM Diesel

LAKE SHORE SOUTH, CHICAGO—AUG. 31ST THROUGH SEPT. 25TH

GM Powerama presents—"roads a-building" exhibit of GM Diesel-powered equipment for both concrete and asphalt highway construction—dump trucks, concrete paver, rock crusher, graders, rollers and scrapers.

MAKE your plans now! The General Motors Powerama will be a national event too important, too spectacular to miss.

On 20 acres of grounds, a World's Fair of Power will unfold wonders galore. Fascinating exhibits—thrilling demonstrations—a colorful stage show—everything to make your visit interesting, educational and well worth the trip.

Come and bring the family. *Admission free!*

Plus many other interesting exhibits you won't want to miss—

ALLISON TURBO-JET and TURBO-PROP engines that power America's finest, fastest fighters and transports.

CLEVELAND DIESEL engines powering a submarine you can go aboard and inspect.

ELECTRO-MOTIVE's advanced lightweight 100-mile-an-hour train with its amazing new air-suspension springing.

EUCLID's full line of 10- to 50-ton Diesel trucks and 7-to 18-yd. scrapers.

FABRICAST's exhibit of modern casting methods.

GMC Diesel trucks and coaches, SceniCruiser and spectacular new "L'Universelle."

And a Complete Exhibition of GM's 7 Dazzling Dream Cars:

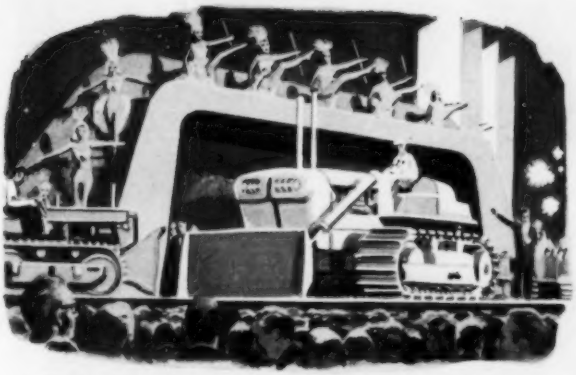
CHEVROLET BISCAYNE • PONTIAC STRATO STAR • OLDSMOBILE "88" DELTA • BUICK WILDCAT III • CADILLAC ELDORADO BROUGHAM LA SALLE II SEDAN • LA SALLE II SPORTS CAR

GM GENERAL MOTORS DIESEL POWER

DETROIT DIESEL ENGINE DIVISION

GENERAL MOTORS • DETROIT 28, MICHIGAN

In Canada: General Motors Diesel, Ltd., London, Ontario

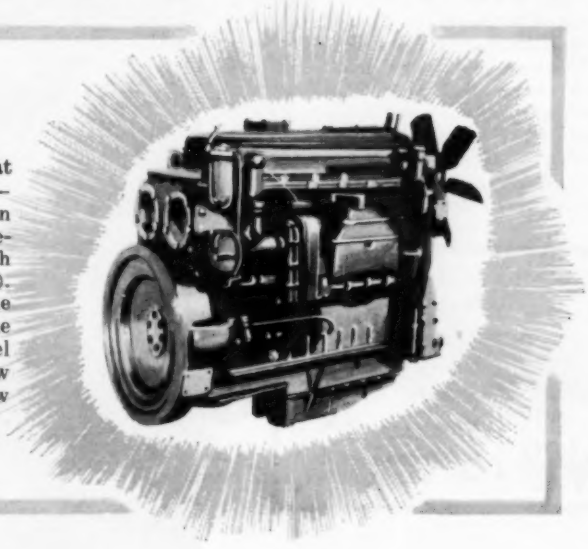


GM Powerama presents—"More Power To You"—a mammoth variety show in which Diesel-powered vehicles perform fantastic maneuvers—with Big Top circus acts and a huge cast of dazzling dancing starlets.

GM Powerama presents—a wide variety of interesting, *operating* exhibits showing the use of Diesel power in many fields including a sawmill, a cotton gin, an irrigation system, a farm tractor and a feed mill.

Horsepower

GM Powerama presents—at the head of the parade—Detroit Diesel's golden "6-71" Diesel engine (representing 100 Millionth General Motors Diesel H.P.). Also, Dr. Diesel's first engine and exhibits ranging from the 1933 World's Fair Diesel engine to the compact new "51" engine that opens new fields for Diesel usefulness.



GM Powerama presents—a marine display including GM Diesel-powered shrimp boat and 36-foot and 22-foot pleasure craft for the interest of those who want Diesel safety, speed and economy in their boats.

GM Powerama presents—a modern, portable oil-well drilling rig in action, powered by General Motors 2-cycle Diesel engines which have won a reputation for "more power in less space with less weight."

This JOY CHALLENGER CUT COSTS 49% in an Indiana Quarry

Recently, after installing a Joy "Challenger" drill, management of May Sand & Gravel Co., Fort Wayne, toted up some comparative figures. They found that their drilling costs had been cut almost in *half!*

Previously, with a churn drill, they had been drilling 500 tons of aggregate and road stone in an 8-hour shift at a cost of 11¢ a ton. Now, the Challenger has increased production to 1700 tons a shift, while reducing drilling cost to 5.7¢ a ton. This Challenger figure breaks down as follows:

Bit cost ..... $ .007	Challenger Model TWM-2
Labor ..... .014	Depth of Hole .....46 Ft.
Fuel & Lube (incl. comp.) ..... .007	Dia. of Hole .....4 In.
Maintenance ..... .010	Drill Pattern 8 Ft. x 10 Ft.
Amortization ..... .019	
Total $ .057	

The Joy Challenger mounts the largest (5¼") hammer drill made today. It drills up to 4½" dia. holes to fifty feet or more in depth in any type of formation, including hard igneous or metamorphic rock. Available in three models: self-propelled on either gasoline- or air-driven tractor—or in unit form for mounting on your truck or tractor.

A second advantage in this case has been realized at the crusher plant. The Challenger's faster drilling speed has permitted a reduction of the drilling pattern at little extra cost. Because fragmentation is better, much of the bothersome and expensive secondary shooting has been eliminated. Crusher plant output has increased more than 25%.

In hundreds of mines and quarries and on construction jobs, Joy Challenger drills are breaking records for low-cost blast-hole drilling. Ask for your copy of Bulletin No. 87-U. ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario*

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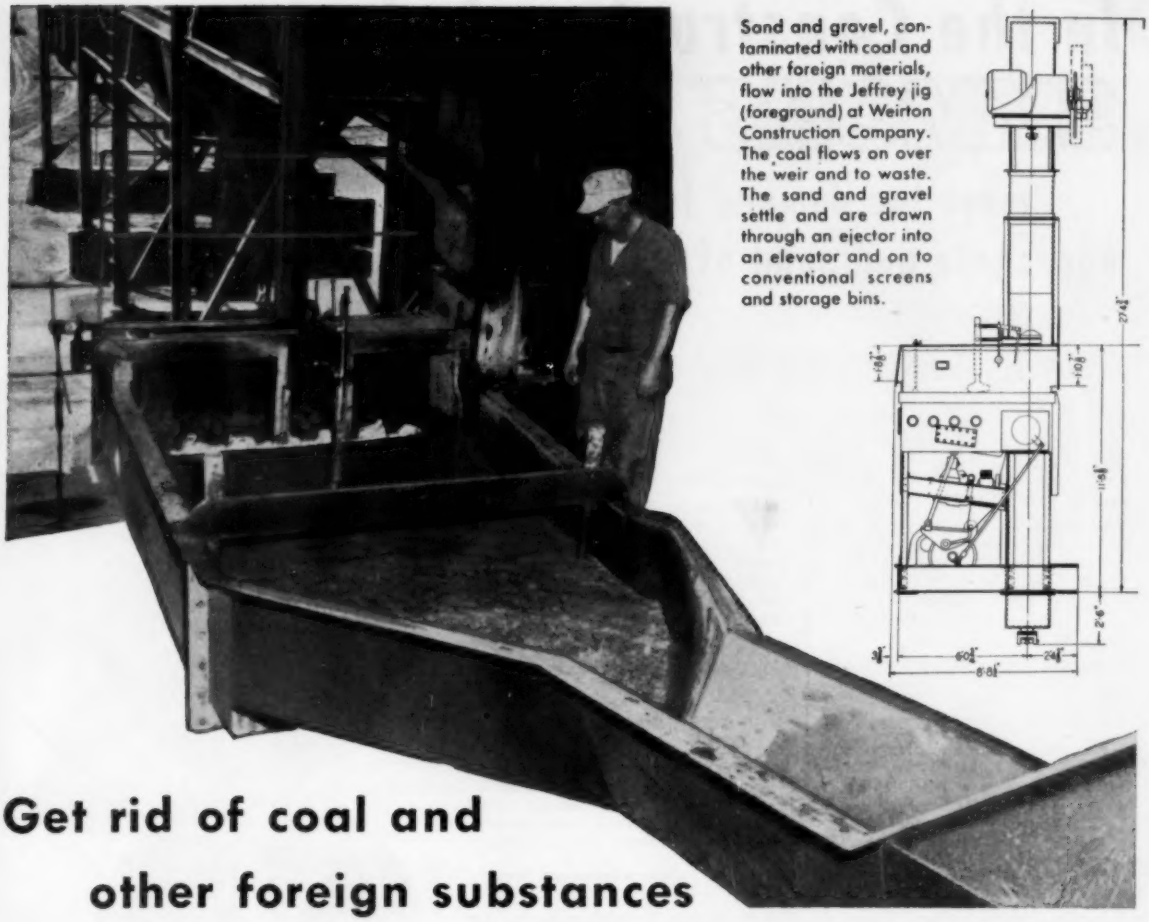
JOY

WORLD'S LARGEST BUILDER OF CORE DRILLS, ROTARY BLAST HOLE DRILLS AND MOTORIZED DRILL RIGS



Sand and gravel, contaminated with coal and other foreign materials, flow into the Jeffrey jig (foreground) at Weirton Construction Company. The coal flows on over the weir and to waste. The sand and gravel settle and are drawn through an ejector into an elevator and on to conventional screens and storage bins.

Get rid of coal and other foreign substances

Make your aggregate more marketable

Sand and gravel operators have a golden opportunity to increase production and profits with this *new* heavy-duty Sand and Gravel Jig.

It brings to the rock products industry the principle of cleaning with pulsating water, as made famous in Jeffrey Coal Washing Jigs. This jig removes coal, shale, clay, roots and sticks — producing sand and gravel of marketable grade at up to 75 TPH.

Weirton Construction Company has had two of these jigs in operation for several years. They report satisfactory performance with low maintenance and few delays.

Jeffrey laboratories are now conducting washing tests on many types of minerals. Our engineers are ready to consider *your* problem.

Write for Bulletin 892.

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

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PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED . . . IT'S A JOB FOR JEFFREY!

In the Construction Industry...

SYMONS® CONE CRUSHERS

meet the demand for vast tonnages of fine aggregate and sand of proper gradation and quality

FOR DAMS AND HYDRO PROJECTS...

like the hundred million dollar Hungry Horse project at Kalispell, Montana, where the General-Shea-Morrison contracting group built one of the largest and highest dams in the country.

(Bureau of Reclamation Photo)

FOR MODERN EXPRESSWAYS...

like the modern Detroit Expressway, with its many interchanges designed for easy, safe access to this high speed highway . . . a good example of the big job being done by the construction industry to help meet the country's highway needs.

(Abrams Aerial Survey Corp. Photo)

FOR BRIDGE CONSTRUCTION...

like the famous George Westinghouse Bridge in East Pittsburgh, Pa. The 460-ft. center span of this bridge is the longest reinforced concrete arch in the United States—and stands as a tribute to the skill and ingenuity of the designers and builders.

(Portland Cement Assn. Photo)

FOR COMMERCIAL AND RESIDENTIAL BUILDINGS...

like the Park La Brea housing project in Los Angeles. Costing $40,000,000 and providing living quarters for 13,000 people, this unit is the largest architectural concrete project in the country.

(Portland Cement Assn. Photo)

• Illustrated here are just four examples of the vast contributions to the progress of mankind being made by the construction industry. With the advent of modern engineering and huge construction projects such as these, specification concrete aggregate has assumed an increasingly important role. To meet the constantly growing demand for vast tonnages of quality aggregate, Symons Cone Crushers have long been the first choice of leading producers throughout the world. In addition, Symons Cones are widely used for preparing sand to meet the rigid specifications prevalent in concrete construction.

For in aggregate and sand production . . . *as in all of the great ore and industrial mineral operations the world over* . . . there has been no record to equal the performance of Symons Cone Crushers that have so consistently and efficiently produced great quantities of finely crushed product at low cost.

Long accepted by experienced contractors and producers for efficient stationary crushed aggregate plants, increasing numbers of successful operators of portable and semiportable crushing plants are now using these sturdy, economical Symons Cones for big capacity of fine product.

Whether you are a contractor, operator, construction engineer, designer or manufacturer, it will pay you to specify and use Symons Cone Crushers . . . as well as the other Nordberg Machinery for the construction industry . . . *all* designed and built to deliver maximum output at lowest possible cost.

Write for literature on the machinery you need.

NORDBERG MFG. CO., Milwaukee, Wisconsin

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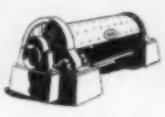
SYMONS PRIMARY GYRATORY CRUSHERS

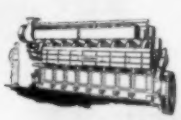
SYMONS VIBRATING GRIZZLIES and SCREENS



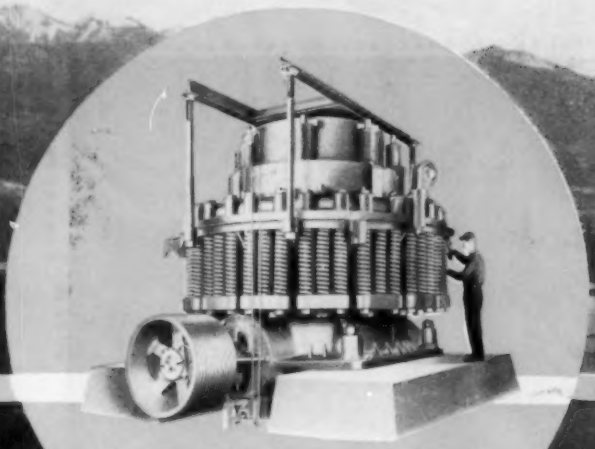
GRINDING MILLS

SYMONS V-SCREENS

ROTARY KILNS and COOLERS



DIESEL ENGINES — 10 to over 12,000 H.P.



SYMONS Cone Crushers . . . the machines that revolutionized crushing practice . . . are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter— in capacities from 6 to 900 tons per hour.

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That's right mister! YOU'RE POINTING TO GREATER EFFICIENCY

When you point to that CP Airleg combination, Mister, why not point out that they team up to give the maximum drilling efficiency obtained when using Tungsten-Carbide bits. And that the leg takes constant recoil shock yet holds the drill firmly to the work. And while you're at it, point to the exclusive pressure release type control handle and balanced feed leg that assure steady bit pressure even under variable line pressure and different rock formations – eliminate "slapping" and reduce bit breakage. Then point to the emergency push button that releases feed-leg pressure instantly. Point out that it's available with a feed cylinder of either steel or aluminum alloy and with 36″ and 48″ feed travel. And that it makes a perfect combination . . . the Chicago Pneumatic Airleg and Sinker Drill! And if your friend has any more questions, Mister, ask him to write *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, New York.*

Chicago Pneumatic

News of the Industry

Marquette Reveals New $16,000,000 Expansion Plan Adds 3,000,000 Bbl. Yearly

Marquette Cement Manufacturing Company recently announced that it is about to undertake a $16,000,000 expansion program which will add nearly 3,000,000 bbl. to its annual producing capacity. Involved is a 1,200,000 bbl. increase at the firm's Cape Girardeau, Mo., plant, a 400,000-500,000 bbl. increase at its Des Moines, Ia., plant, and an additional 1,200,000 bbl. of capacity to be made available either at its Oglesby, Ill., plant or, more likely, by construction of a new plant in the Chicago area. In either event the additional production will be available to the Chicago and Milwaukee markets.

Certain details of financing and engineering remain to be completed, but all three projects have been approved in substance by Marquette's board of directors. Effort will be made to have all three completed by the end of next year.

Construction at the Des Moines plant is to begin immediately and the additional capacity there can be available about mid-1956, according to Marquette President W. A. Wecker. There the 400,000-500,000 bbl. of increased capacity will be achieved largely through installation of additional grinding facilities. Ample kiln capacity is already available. Cost of the improvements, including more storage capacity for the finished product, is estimated at approximately $1,750,000. This new capacity will bring total annual production of the plant to 2,500,000 bbl.

For the Cape Girardeau plant Marquette is designing an independent one-kiln, wet-process unit, complete with cement storage and bulk loading facilities at the company dock on the Mississippi River, which will produce 1,200,000 bbl. for distribution through the company's shipping plants at St. Louis and Memphis. Here it is expected that economies in construction will be effected by eliminating the usual raw material craneway storage from the design of the new unit and by horizontal rather than vertical arrangement of the various facilities required for the raw and finish grinding operations. It is therefore expected that this entire new producing unit will cost less than $6,500,000. It will bring annual capacity of Marquette's Cape Girardeau plant to a total of 3,000,000 bbl.

Plans for the increased production in the Northern Illinois-Wisconsin market currently served by Marquette's Oglesby plant are less definite at the moment. The decision as to whether to locate the new facilities at Oglesby or at one of several sites already surveyed in the Chicago area will, however, be made within the next few weeks.

President Smith W. Storey of General Portland Cement has announced that the firm's Dallas, Tex., plant will be increased in annual productive capacity by 1,250,000 bbl. Work on the expansion has already begun.

National Gypsum Company Opens $6,000,000 Mines Located Near Halifax, N. S.

Melvin H. Baker, chairman of the National Gypsum Company, recently officially opened the firm's new gypsum mines near Halifax, Nova Scotia. Three 15,000-ton cargo ships are under construction in Germany to ship the mines' output to the company's seaboard plants.

More than $6,000,000 has been spent to date moving the overburden, laying more than five miles of railroad track, constructing buildings and roads, and installing equipment and loading facilities. The mines are located at Wright's Cove, just across the bay from Halifax.

A harbor has been dredged which gives a minimum of 33 ft. of water; and a dock which is 650 ft. long has been built. Harbor facilities are capable of loading 4,000 tons per hour. Between 70 and 75 cars are loaded daily to supply the ships.

Coming Events

August 31-September 25, 1955—Chicago. General Motors Powerama—exposition of diesel-powered equipment. Century Exposition Hall.

September 12-14, 1955—Gatlinburg, Tenn. Third national conference of county and highway officials. Greystone Hotel.

September 19-24, 1955—White Sulphur Springs, Va. Fall meeting, National Industrial Sand Association. The Greenbrier.

October 10-13, 1955—Las Vegas, Nev. Annual convention, American Mining Congress.

October 17-21, 1955—Chicago. 43rd National Safety Congress and exposition. Conrad Hilton, Congress, Morrison, and La Salle Hotels.

October 19-21, 1955 — Pebble Beach, Calif. Combined annual convention and operators' meeting. National Lime Association. Del Monte Lodge.

January 23-25, 1956—New Orleans. 36th annual convention, National Concrete Masonry Association. Roosevelt Hotel.

February 13-16, 1956—Chicago. 40th annual convention, National Sand and Gravel Association, 26th annual convention, National Ready Mixed Concrete Association, and combined exhibit. Headquarters, Conrad Hilton Hotel; exhibit, Coliseum.

February 15-17, 1956—Chicago. Annual convention, National Agricultural Limestone Institute, Inc. Blackstone Hotel.

February 20-22, 1956—Chicago. 39th annual convention and biennial exhibit, National Crushed Stone Association. Conrad Hilton Hotel.

$12,000,000 Plant Planned By Permanente Cement Near Victorville, Calif.

The Permanente Cement Company will expand its operations into southern California with the construction of a new $12,000,000 cement plant in San Bernardino County, according to Henry J. Kaiser, chairman of the board and president. The company has filed a location and development plan with the County Planning Commission, preliminary to obtaining a building permit.

The plant, which will have an initial capacity of 2,000,000 bbl. of portland cement annually, is scheduled to begin production in the early fall of 1956. It will have a permanent labor force of about 175, with an annual payroll of nearly $1,000,000. Construction is expected to begin in about 90 days, and bids will be invited as soon as engineering is completed by Kaiser Engineers Division of Henry J. Kaiser Company, which is designing the facilities and will supervise construction.

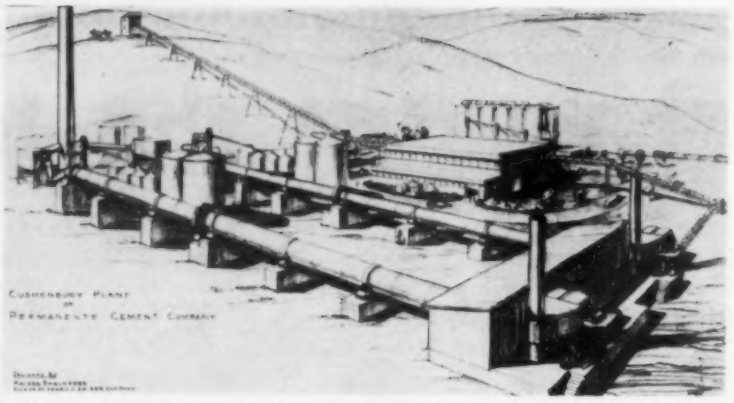
According to reports, the plant and adjacent quarry to supply limestone are to be located on a limestone deposit in the Cushenbury area, near the town of Lucerne Valley, approximately 30 miles southeast of Victorville.

Permanente will lease, on a long term basis, some of the properties now held under option by Kaiser Steel Corporation. Location of the plant adjacent to the quarry site will enable the quarried limestone to be delivered for the cement-making operation *via* an economical conveyor belt system.

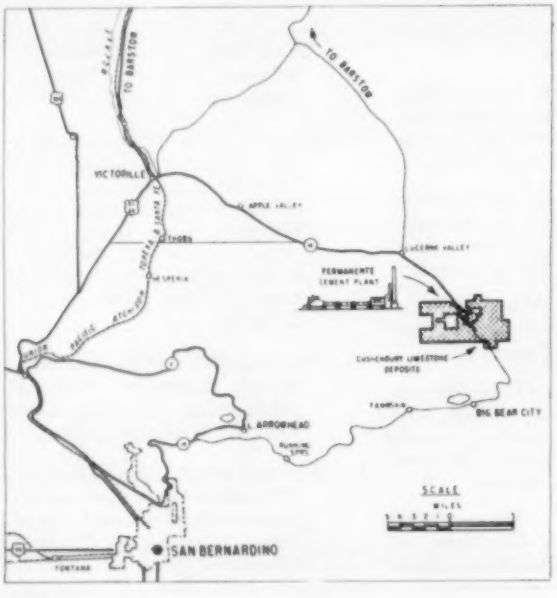
A 32-mile railroad will be built to connect the plant and quarry with the main rail line at a point near Hesperia, Calif.

Equipment will include installation of a modern electrostatic dust-collecting system preceded by mechanical collectors. Other mechanical and bag-type collectors will be installed throughout the process.

These facilities are designed to allow for future increases in capacity to keep pace with the continuing growth of southern California. Entry into this market also opens the possibility of activating the company's Long Beach distribution plant. This 60,000-bbl. facility, equipped to handle bulk cement ships, was purchased several years ago as an outlet to the Greater Los Angeles area, for Permanente's future expansion southward.



Engineer's drawing of the proposed new $12,000,000 cement plant of the Permanente Cement Company, to be erected in San Bernardino County. Capacity will be 2,000,000 bbl. annually.



This map shows the location of the plant, which is to be built in the Cushenbury area, near Lucerne Valley, Calif., approximately 30 miles southeast of Victorville.

M. L. Silcox Is Appointed Penn-Dixie Operating Mgr.

Appointment of M. L. Silcox as general operating manager of the Penn-Dixie Cement Corporation, effective August 1, 1955, has been announced. He will be in charge of all operating and engineering activities of the company. Mr. Silcox succeeds E. P. Newhard, vice-president and operating manager, who will retire on September 1 after 45 years with the company and its predecessors.

M. L. Silcox

Mr. Silcox, who will make his headquarters at Nazareth, Pa., has been with Penn-Dixie since its inception in 1926. He became associated with the Clinchfield Portland Cement Company, a predecessor company, in 1921. From 1926 to 1945 he was Penn-Dixie's chief chemist. He became superintendent at Clinchfield in 1945.

"WE CAN HANDLE 1000 TONS A DAY AND CAN PRODUCE WHAT THE PUBLIC WANTS"

U. C. SHOFFNER, SHOFFNER SAND & GRAVEL CO., SALINA, KANSAS

As in practically every state, the number of Eagle installations in Kansas continues to grow. You can't beat facts and the facts are that Eagle Washing-Classifying Equipment cleans and classifies material to exact specification, fast and at low cost. Quickly returns its cost. Eagle has the experience, the broadest line of equipment and by far the greatest number of installations. Ask us what EAGLE EQUIPMENT is doing in your state!

Bowersock Mills & Power Co., Lawrence, Kans., successfully uses an Eagle Water Scalping-Classifying Tank with two-cell collecting-blending flume in combination with an Eagle Single Screw Washer-Classifier-Dehydrater. User reports material processed readily meets local and state specifications. This producer has long used an Eagle "Swintek" Dredging Ladder to good advantage.

Shoffner Sand & Gravel Co., Salina, Kans., got rid of the mud ball problem with Eagle Washers. They state, "We can handle 1000-tons a day and can produce what the public wants." All material passes state specifications with plenty of minus 50 mesh. Shoffner operates 8 Eagle units at various plants.

Your factory-trained EAGLE DISTRIBUTOR has the answers!

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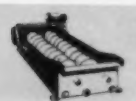

COARSE MATERIAL WASHERS

LOG WASHERS

"SWINTEK" DREDGE LADDERS

COMPLETE DREDGES

BREAKER BALLS

PILE HAMMERS

A.I.M.E. Regional Meeting Planned for Rapid City, S.D. Features Varied Program

The Black Hills Section of the American Institute of Mining Engineers will be host to the Mining Branch of A.I.M.E. at a regional meeting scheduled for October 2 to 5, 1955. Technical sessions of the meeting will be held on the campus of the South Dakota School of Mines and Technology in Rapid City on the 3rd and 4th. Papers of interest to the following divisions will be presented: Coal, Industrial Minerals, Geology, Mining, Minerals Beneficiation, Mineral Economics, Mineral Education, and Geophysics.

Activities for the 2nd will be at Lead, S. D., and will include a visit to the operations of the Homestake Mining Company, with a western buffalo barbecue in the evening. On the last day, October 5, field trips to nearby points of significant interest will be taken to allow observation of the following operations: mining and milling of bentonite, uranium mining, pegmatite mining and milling, and mica processing; a study of the geological features of the Black Hills and Bad Lands region of South Dakota.

Pre-registration information can be secured from Prof. E. H. Oshier, Mining Department, South Dakota School of Mining and Technology, Rapid City, S. D.

Kaiser Concern Breaks Ground On New Ohio Refractory Plant

Kaiser Aluminum & Chemical Corporation's new basic refractory brick plant, to be built at Columbiana, Ohio, progressed toward a definite start with the awarding of some 30 contracts covering construction and equipment as announced recently by Frank M. Cashin, vice-president and manager of Kaiser Chemical Division.

Ground breaking on the 160-acre plant site will take place within a few weeks. The $4,000,000 plant, which will produce high temperature products for the cement, steel, glass, and copper industries, is expected to be completed by late spring, 1956. Engineer contractor for the project is Kaiser Engineers, a division of the Henry J. Kaiser Company, Oakland, Calif.

National Gypsum Company, Buffalo, N. Y., recently announced plans for the construction of a new gypsum wallboard and plaster plant, to be located in Burlington County, N. J.

4-wheel drive does another job better!

REACHING REMOTE WORK SITES

Beyond the road's end, where the going is rough and steep, you can depend on the sure-footed 4-wheel-drive pulling power of the Universal 'Jeep' to take you to the job. With a 'Jeep' you can climb steep grades, maneuver through dense woods, drive through loose rock and sand—*and get there!* That's why the 'Jeep' has become essential equipment for engineers, contractors, geologists, miners and lumbermen. See your Willys dealer or write for information.

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A member of the 'Jeep' family, world's largest-selling 4-wheel-drive vehicles

Willys Motors, Inc., Toledo 1, Ohio, U. S. A.

L. T. Sunderland Dies At 87 in Kansas City— Cement Industry Veteran

Lester T. Sunderland, chairman of the executive committee of the Ash Grove Lime & Portland Cement Company, died on August 3 at his home in Kansas City, Mo., at the age of 87 years. He had been active in the Ash Grove firm until he became ill about four months ago.

Mr. Sunderland long had been a leader in the cement industry. In 1921 and 1922 he served as president of the Portland Cement Association. Throughout his later life he had been on the association's board of directors and had filled a number of committee posts.

Mr. Sunderland, who was born in Vinton, Iowa, left school at the age of 14 to work in a coal business in Ottumwa, Iowa. Later he left that job to complete his education at Pillsbury academy, Owatonna, Minn.

In 1887 he joined an older brother, James A. Sunderland, in the coal business in Omaha. In 1909 Mr. Sunderland moved to Kansas City to join the Ash Grove firm as vice-president and general manager, shortly after the company had built its first portland cement plant at Chanute, Kans. Since that time the Ash Grove company has built a cement plant at Louisville, Neb., and operates two lime plants in Springfield, Mo.

In 1913 he was elected president of Ash Grove, a position he held for 33 years before he was elected chairman of the executive committee.

Two of his sons are officers in the Ash Grove company. Paul Sunderland, is chairman of the board, and Allan B. Sunderland is president.

New Cement Plant Planned By Southern Rhodesia Firm

The Salisbury Portland Cement Company Ltd., registered in Salisbury, Southern Rhodesia, sponsored by The Associated Portland Cement Manufacturers Ltd. of London, England, is constructing a 120,000-ton dry-process works near Salisbury, S.R. Although a certain amount of construction in connection with employees' housing, water reticulation, sewerage, etc., is well under way and the major items for the plant have been ordered, the actual plant design is still in the drawing board stage. Tenders for works construction will not be called for until another month or two has passed.

White's South African Portland Cement Company Ltd., Lichtenburg, Transvaal, works are being extended by the addition of a third kiln.

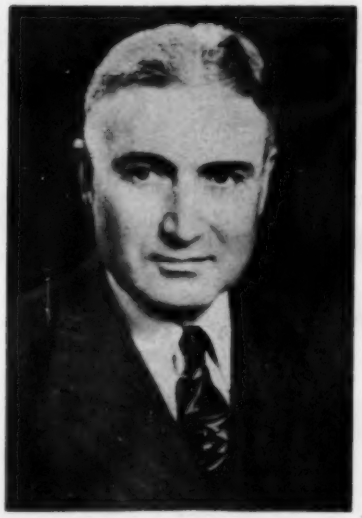
Lehigh Reveals Promotions Of C. Browning and P. Groll To Vice-President Posts

A recent announcement by Joseph S. Young, president of Lehigh Portland Cement Company, Allentown, Pa., stated that C. Glenn Browning had been elected vice-president-sales, and that P. A. Groll had been made vice-president-manufacturing.

Mr. Browning started with the company in 1921 as a sales clerk in Allentown, later becoming district sales manager at Richmond, Va., in 1922. He was appointed division sales manager in 1936 and eastern sales manager in 1946. In 1947 he was elected vice-president and general sales manager and in 1954 made a member of the board of directors.

Mr. Groll joined the company in 1925 as a chemist at the Alsen, N. Y., plant. In 1934 he was appointed chemist at Oglesby, Ill., and in 1945 was made plant manager. He moved to Allentown in 1949 as assistant operating manager, and in 1954 was elected vice-president and operating manager.

C. G. Browning



P. A. Groll

Calaveras Directors Approve $4,000,000 Expansion Plan

Directors of the Calaveras Cement Co. recently approved a $4,000,000 expansion plan which will add a fifth kiln to the San Andreas, Calif., plant. Included in the project are coolers, dust collectors, raw and finish mills, and eight cement storage silos.

The new kiln, which will be fabricated by the Allis-Chalmers Mfg. Company, will be 360 ft. long and 11 ft. 3 in. in diameter.

This addition will bring the plant's annual production to 4,500,000 barrels a year, or an increase of 30 percent.

A building permit for construction of the cement plant in Milwaukee, Wis., which the Universal Atlas Cement Company announced last November has been granted. It provides for construction costing $1,-173,300. Completion of the plant is expected in the latter part of 1956.

Medusa Portland Cement's $6,000,000 Expansion Plan To Up Output 2,000,000 Bbl.

Medusa Portland Cement Company plans to spend $4,000,000 for modernization of existing plants and an additional $2,000,000 for a new kiln at its York, Pa., facility within the next 18 months, according to a recent announcement by company officials.

This brings to $14,000,000 the amount committed for capital improvements. Capacity at the firm's seven plants totals 8,250,000 bbl. annually, and will be 10,250,000 bbl. a year when the current expansion is completed.

• Correction

In the August issue, we announced the appointment of Tractor & Implement Co., Sidney, Mont., as distributor for Nordberg Manufacturing Co., Milwaukee, Wis. It has been called to our attention that Tractor & Equipment will distribute only the Nordberg Power Chief Diesel and Gas Engines. They will not handle crushers, screens and process machinery or the larger diesel engines and railroad maintenance machinery.

4-wheel drive does another job better!

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You can save the cost of an auxiliary engine and the time lost in loading or towing it by putting a 4-wheel-drive Universal 'Jeep' on the job. With power take-off, the 'Jeep' operates air compressors for pneumatic tools as shown above, electric power generators and other belt-driven equipment. See your nearest Willys dealer or write for information.

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Please send me, without obligation, a copy of your booklet, "The Right Rope for the Job," which lists the correct Tiger Brand Ropes to use for hundreds of typical applications.

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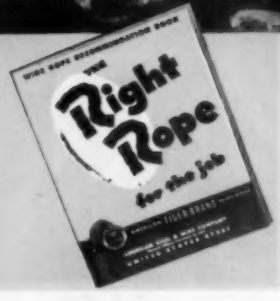

overburden moved with one Tiger Brand Hoist Rope

IMAGINE 12,587 50-ton freight cars strung out end-to-end. They would make a train more than 80 miles long; and if each car was level full, the entire train would contain 1,000,000 cubic yards of material. That's how much overburden this big coal stripping shovel moved with one American Tiger Brand Hoist Rope.

Despite hard digging, a 2⅜" Tiger Brand Wire Rope lifted and lowered the fully loaded 45 cu. yd. bucket *20,000* times before it had to be replaced. This equipment is used by Central Ohio Coal Company which supplies coal for The Ohio Power Company's new Muskingum River electric power generating plant. This company also uses Tiger Brand Wire Rope on its 18 cu. yd. shovels.

You will like Tiger Brand, too. It lasts long in *any* type of service.

Send the coupon for our recommendations of the right rope to use on your machines.

Regular lubrication of sheaves helps prevent excessive wear of the Tiger Brand Ropes on these big machines.

This 18 cu. yd. electric shovel and the 45 cu. yd. job shown on the opposite page are stripping overburden 3 shifts a day *every* day at Central Ohio Coal Co.'s big Muskingum Mine near Zanesville, Ohio. Tiger Brand Rope is giving excellent service on both these hard-working machines.

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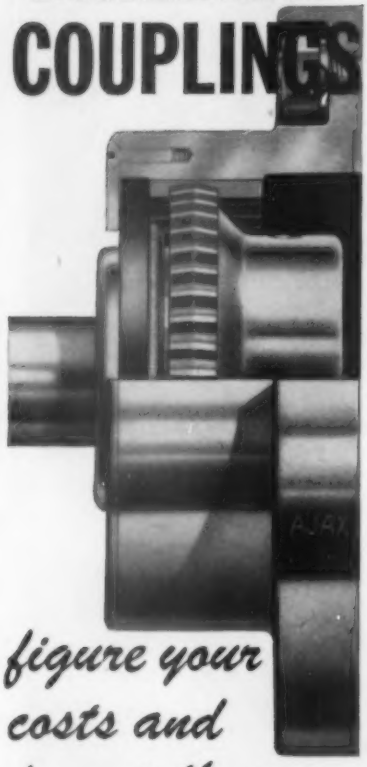


figure your costs and forget the price

● Ajax Dihedral Couplings are made to order for tough misaligment jobs. They handle misalignment heretofore considered excessive on stationary and mobile equipment involving weaving structures, heavy horsepower and shock loads.

One shutdown of your yard or plant makes the extra cost of an Ajax Dihedral Coupling insignificant!

Seals keep lubrication in and abrasive grit out.

If you have misalignment trouble you can't afford to be without Ajax Dihedral Couplings. Tell us your troubles.

AJAX FLEXIBLE COUPLING CO. INC.
WESTFIELD, N. Y.

Eastern Building Totals Show Highest Figures For July, 7-Month Period

Contract awards for future construction in the 37 states east of the Rockies, as measured by the Dodge Reports, set a new high record for any July, F. W. Dodge Corporation announced. The total was $2,271,537,000, up 24 percent from July, 1954.

The first seven months set a new high for that period—$14,254,308,000—up 29 percent from 1954. It fell only a shade short of matching the first *nine* months of last year, when the total was $14,477,181,000.

Nonresidential led the way in percentage gains over last year. The July figure was the third-highest ever attained in this Dodge category. It was $892,629,000, up 39 percent from last year. This is largely the kind of construction that will be going into place and pouring out dollars for months ahead, extending into the holiday buying season and into next year.

For July the residential total was $959,020,000, up 29 percent from July, 1954. Public and private works and utilities totalled $419,888,000, down 7 percent.

Seven-month totals were as follows: nonresidential, $5,025,142,000, up 24 percent over the same period last year; residential, $6,415,750,000, up 36 percent; and public and private works and utilities, $2,813,416,000, up 22 percent.

Carolina Giant Cement Co. To Increase Capacity by 60%

The Carolina Giant Cement Company, Harleyville, S. Carolina, has announced plans for increasing its capacity by approximately 60 percent. Additional land totalling 600 acres adjacent to the plant has already been purchased, and is expected to provide sufficient raw material for many years to come.

The plant was originally built by the government as a wartime operation for the extraction of alumina, and was established as a cement plant in 1948 by the firm as an 800,000-bbl. unit. Doubled in size three years ago at a cost of about $5,000,000, it is now producing approximately 1,800,000 bbl. annually, with the new expansion expected to bring the total to nearly 3,000,000 bbl.

A direct loan of $90,000 has been approved by the Small Business Administration to McNeely Stone Company, Inc., of Ellettsville, Ind. The firm, headed by Roy McNeely, president, employs 80 persons.

May Lime Sales Show Rise Over May, '54 and Last Month

Domestic sales of open-market lime totaled 800,515 short tons in May, according to reports of producers to the U.S. Bureau of Mines.

Sales for building, refractory, chemical, and other industrial uses increased, as compared to the previous month, whereas a slight decrease was noticed in agricultural lime.

The accompanying table shows sales by types and major uses.

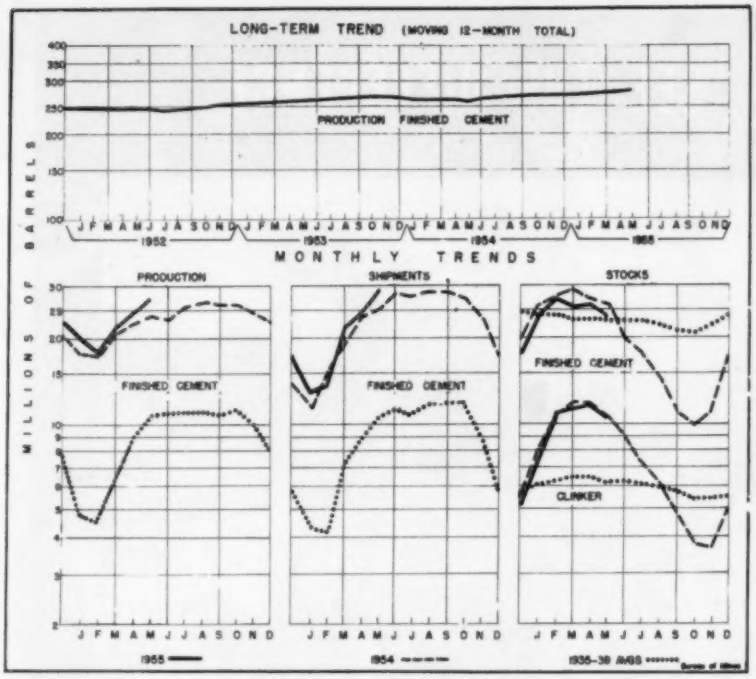
Lime Sold by Producers[1] in the United States, in Specified Periods of 1954-55, by Types and Major Uses, in Short Tons

	April	May		January-May	
	1955	1955	1954	1954	1955
By types:					
Quicklime	[2]597,978	616,063	465,233	2,254,289	2,867,140
Hydrated lime	[2]178,858	184,452	157,651	771,232	786,468
Total lime[3]	[2]776,836	800,515	622,884	3,025,521	3,653,608
By uses:					
Agricultural:					
Quicklime	13,364	13,829	7,367	37,218	36,221
Hydrated lime	27,744	23,866	19,388	104,180	84,797
Total	41,108	37,695	26,755	141,398	121,018
Building:					
Quicklime	16,209	15,528	15,753	75,766	95,911
Hydrated lime	89,811	95,198	79,732	372,015	391,215
Total	106,020	110,726	95,485	447,781	487,126
Chemical and other industrial:					
Quicklime	[2]368,863	383,357	295,753	1,423,726	1,775,956
Hydrated lime	[2]61,303	65,388	58,531	295,037	310,456
Total	[2]430,166	448,745	354,284	1,718,763	2,086,412
Refractory (dead-burned dolomite)	199,542	203,349	146,360	717,579	959,052

[1]Also includes a small quantity of captive tonnage (6-7 percent of the total reported herein) to maintain comparability with the annual lime statistics. The monthly canvass excludes the output of plants producing less than 10,000 tons a year.

[2]Approximately 60 percent of lime produced is high calcium and 40 percent high magnesium.

[3]Revised figure.



SUMMARY—Production of finished portland cement in May, 1955, as reported to the U. S. Bureau of Mines, totaled 27,066,000 barrels—an increase of 16 percent over the May, 1954, figure. Mill shipments totaled 29,172,000 barrels—17 percent more than in May, 1954—while stocks of 23,610,000 barrels of finished portland cement on hand May 31, 1955, were 7 percent less than on the same date a year ago. Clinker production during the month totaled 25,816,000 barrels—an increase of 17 percent over the May, 1954, figure.

PRODUCTION—One hundred fifty-seven (157) plants in 37 states and Puerto Rico reported a production of 27,066,000 barrels of finished portland cement during May, 1955, as compared to a production of 23,279,000 barrels during the same month the previous year.

Clinker production during the month was 25,816,000 barrels, compared to 21,992,000 barrels during May, 1954.

Clinker figures for 1955 are not strictly comparable with those of 1954 and earlier years because producers now are asked to report clinker in terms of the number of barrels of finished portland cement that could be produced from the quantity of clinker in question, whereas previously the unit of measure was the 376-lb. barrel.

Separate data on high-early-strength (Type III) by districts and prepared masonry cements appear in this year's reports. Production of high-early-strength portland cement in May, 1955, totaled 783,000 barrels, an increase of 18 percent over the May 1954, production. The output of prepared masonry cement was 1,484,000 barrels of 376-lb. each.

SHIPMENTS—Mill shipments of finished portland cement were 17 percent higher than in May, 1954, and totaled 29,172,000 barrels. This figure and the district totals that comprise it are not strictly comparable with mill shipments of previous years because they do not include as in the past, the number of barrels of finished portland cement used in the manufacture of prepared masonry cements. The quantity so used is shown in a footnote.

Shipments in May were higher in all districts except the Indiana-Kentucky-Wisconsin district. The greatest increase was registered in the New York-Maine district and substantial increases were made in the Western Missouri-Nebraska-Oklahoma-Arkansas, Puerto Rico, Tennessee, and Iowa districts.

Mill shipments of high-early-strength cement in May, 1955, totaled 1,108,000 barrels. More than half of these shipments were from mills in the eastern Pennsylvania-Maryland, and Michigan districts.

Mill shipments of prepared masonry cement in May, 1955, totaled 1,493,000 barrels, half of which was shipped from mills in four districts—eastern Pennsylvania-Maryland, Indiana-Kentucky-Wisconsin, Michigan, and Virginia-Georgia-Florida-Louisiana-South Carolina-Mississippi. Prepared masonry cement data are shown in equivalent barrels of 376-lb. each to maintain uniformity with the portland cement data.

STOCKS—Mill stocks of 23,610,000 barrels of finished portland cement were on hand on May 31, 1955—7 percent less than on May 31, 1954. Stocks of clinker at the end of May, 1955, were 10,439,000 barrels—an increase of one-half percent over the stock on hand May 31, 1954.

Construction Begun at Shoals On Gen'l Refractories Plant

Work has begun on constructing the processing plant of the General Refractories Company near Shoals, Ind. Dean Lewis of Claysburg, Pa., construction superintendent on the job, said plans for opening of the quarry on State 550 are completed.

The quarry is located about two miles southwest of the processing plant site. Approximately 500 tons of quartz will be mined daily, with a supply adequate for 100 years.

RANITE "BX"
Hardfacing Saves Crusher Mantle from Junk Heap

Illustration shows mantle after final hardsurfacing layer has been applied.

● Back in 1950 the City Rock plant in Sunland, California (now owned and operated by Livingston Rock & Gravel Co.), ran up against a problem.

● The mantle of its primary gyratory crusher had become so badly worn that, unless quickly replaced, a long shutdown was in prospect. Casting a new mantle and shipping it from the East would require at least a month!

● Rebuilding the mantle by welding, however, solved the problem, quickly and economically. Three welders, putting in 120 working hours and using 400 lbs. of RANITE "BX" ¼ in. Hard-Surfacing Rod and 200 lbs. of stainless steel, got the big crusher back into operation in exactly 5 days!

● Ever since, at 2-year-intervals, the mantle has been re-surfaced again with RANITE "BX" to keep the crusher busy at its task of breaking up to 200 tons per hr. of hard river rock at a 4½ in. setting.

● This experience is typical of many in the pit-and-quarry industries where the proper application of low-cost RANITE Hard-Surfacing Rods is prolonging the life of gyratory, jaw, and roll crushers, bucket teeth, screen plate, etc. Save time, trouble and maintenance expense by contacting your nearest RANITE representative, or write direct to:

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ALHAMBRA, CALIFORNIA

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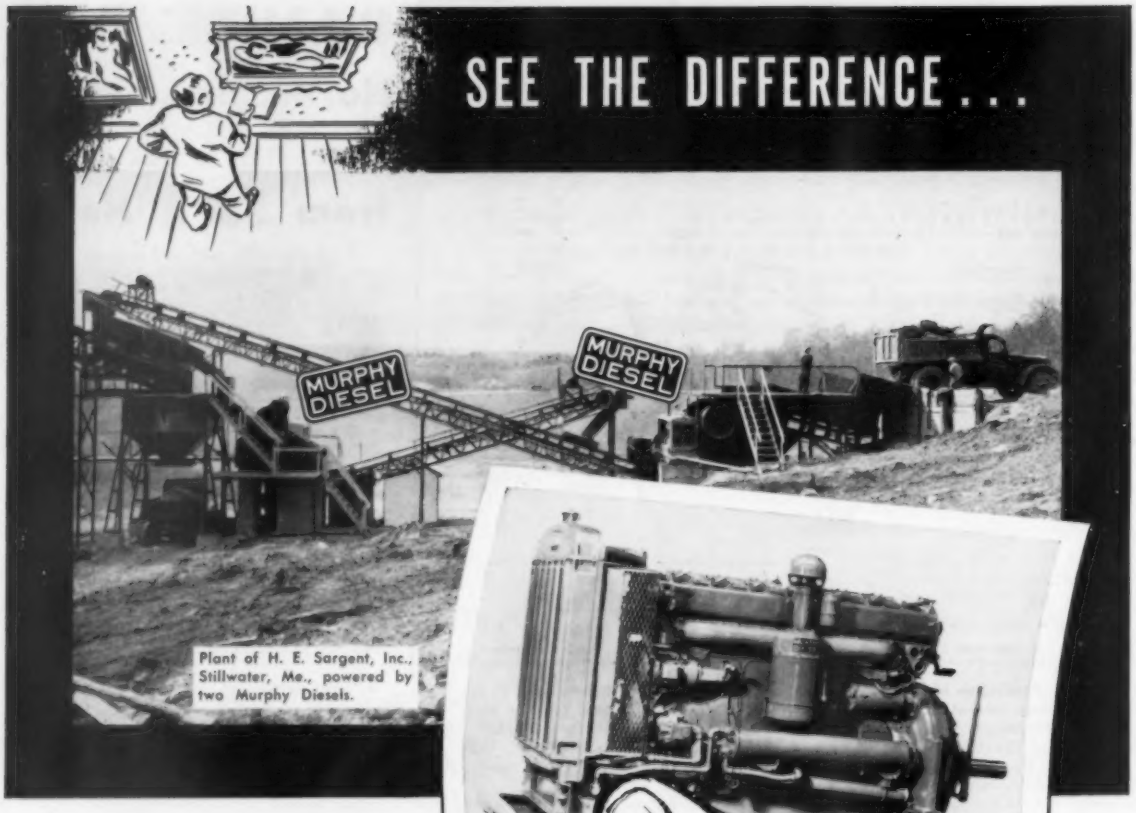

Plant of H. E. Sargent, Inc., Stillwater, Me., powered by two Murphy Diesels.

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When you bring Murphy Diesel into your operating picture, you see a big difference in many ways.

You'll see the difference in your fuel cost records — because the Murphy Diesel costs less to operate than any other engine of comparable size.

You'll see the difference in down-time — because the Murphy Diesel is a heavy duty engine, designed and built for continuous service.

You'll see the difference in output — because the Murphy Diesel delivers the kind of power that enables you to get the most work out of any plant.

Check the experience of other rock operators and then ask your Murphy Diesel Dealer to show you what a difference a Murphy Diesel will make in your picture.

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Sales, parts and service throughout the nation

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Heavy duty power

for rock crushing

Murphy Diesel Engines and Power Units for rock crushing, 96 to 248 H.P. Generator Sets, 60 to 155 K.W.

326

THIRD MARION FOR EASTERN CEMENT PLANT

An eastern producer of Portland Cement bought their third MARION machine to round out a recent expansion program.

The selection of a MARION 101-M for this New York State operation is a tribute to the satisfaction two earlier MARIONS have given in heavy digging.

Get the full story on this heavy-duty 3-yard machine, available either with diesel or electric power.

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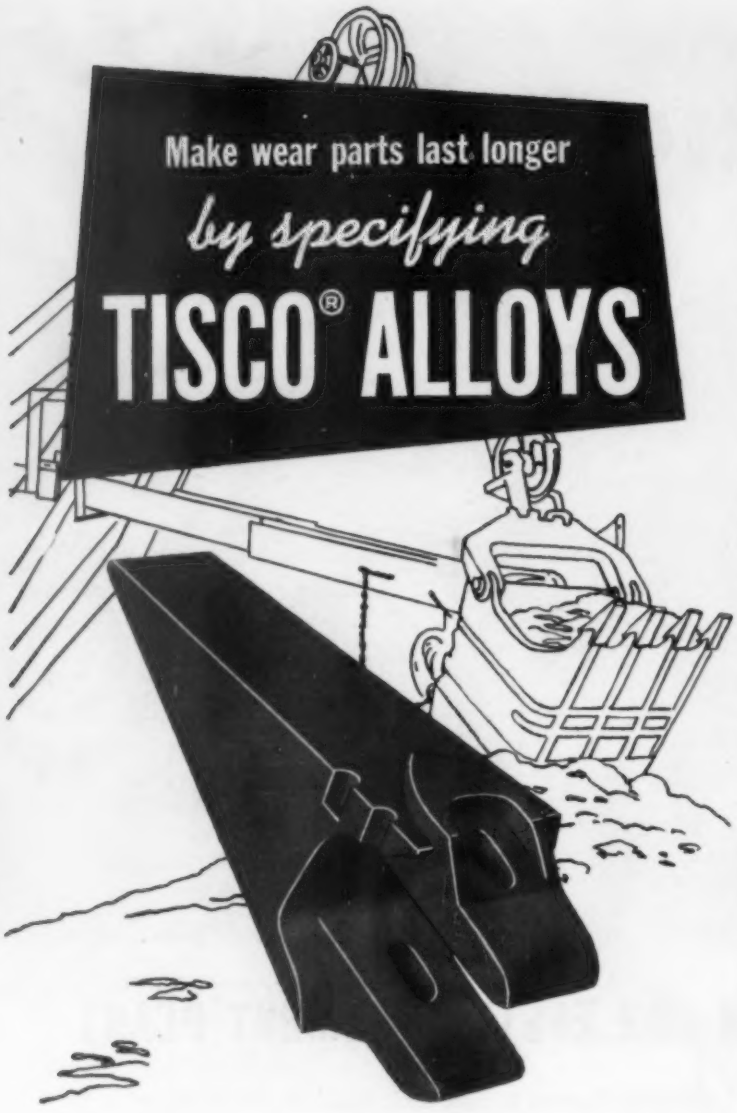


For almost seven decades Taylor-Wharton has specialized in research, development and production of wear-resistant alloys. Tisco Manganese Steel has become widely known in the mining and stone products industries for wear parts of power shovels, jaw crushers and other heavy duty equipment subjected to wear in a combination of impact and abrasion. It is still unsurpassed under such conditions.

More recently, too, Taylor-Wharton has developed other alloys for special purposes. Among these is Tisco 150-Y, a high chrome cast iron, capable of heat treatment up to 700 Brinell with strong resistance to severe abrasion, where impact is not a factor. Another useful alloy is Tisco 23-Y, a medium manganese chrome molybdenum alloy that can be hardened by heat treatment to 300-500 Brinell. It has excellent abrasion resistance with fair impact qualities.

These and other Tisco Alloys are at your service to lower maintenance costs. Ask us about them.

TAYLOR-WHARTON Iron & Steel Co.

(Division of Harrisburg Steel Corporation)

HIGH BRIDGE 3, NEW JERSEY

Use TIMANG Weld Rods and Shapes for rebuilding and repairing worn parts made of manganese steel.

Birmingham, Ala. Cincinnati, O. Easton, Pa.

$875,000,000 Allotment Granted for Federal Aid To State Highway Program

Secretary of Commerce Sinclair Weeks announced recently the apportionment of $875,000,000 as federal-aid to the states for highways, five months ahead of the time limit set by Congress.

This is the second and last apportionment under the provisions of the Federal-aid Highway Act of 1954 approved by the president on May 6, 1954. The act authorized a total of $1,932,000,000 for grants to states and other Federal highway projects for the fiscal years beginning July 1, 1955 and 1956. It is the largest two-year sum ever provided for federal highway program.

A similar apportionment in June of last year accelerated the Federal-aid program by about 20 percent in the fiscal year just ended. An even greater increase is expected in the current fiscal year.

The act covers the following Federal-aid projects: primary highway system, $315,500,000; secondary system, $210,000,000; primary highway system in urban areas, $175,000,000; and national system of interstate highways, $175,000,000.

The primary Federal-aid system consist of 215,595 miles of rural highways and 18,812 miles of urban highways, making a total of 234,407 miles. This is the general network of main highways of the country. Its most important arteries comprise the interstate system. The system was designated in co-operation with the states as result of legislation in 1921.

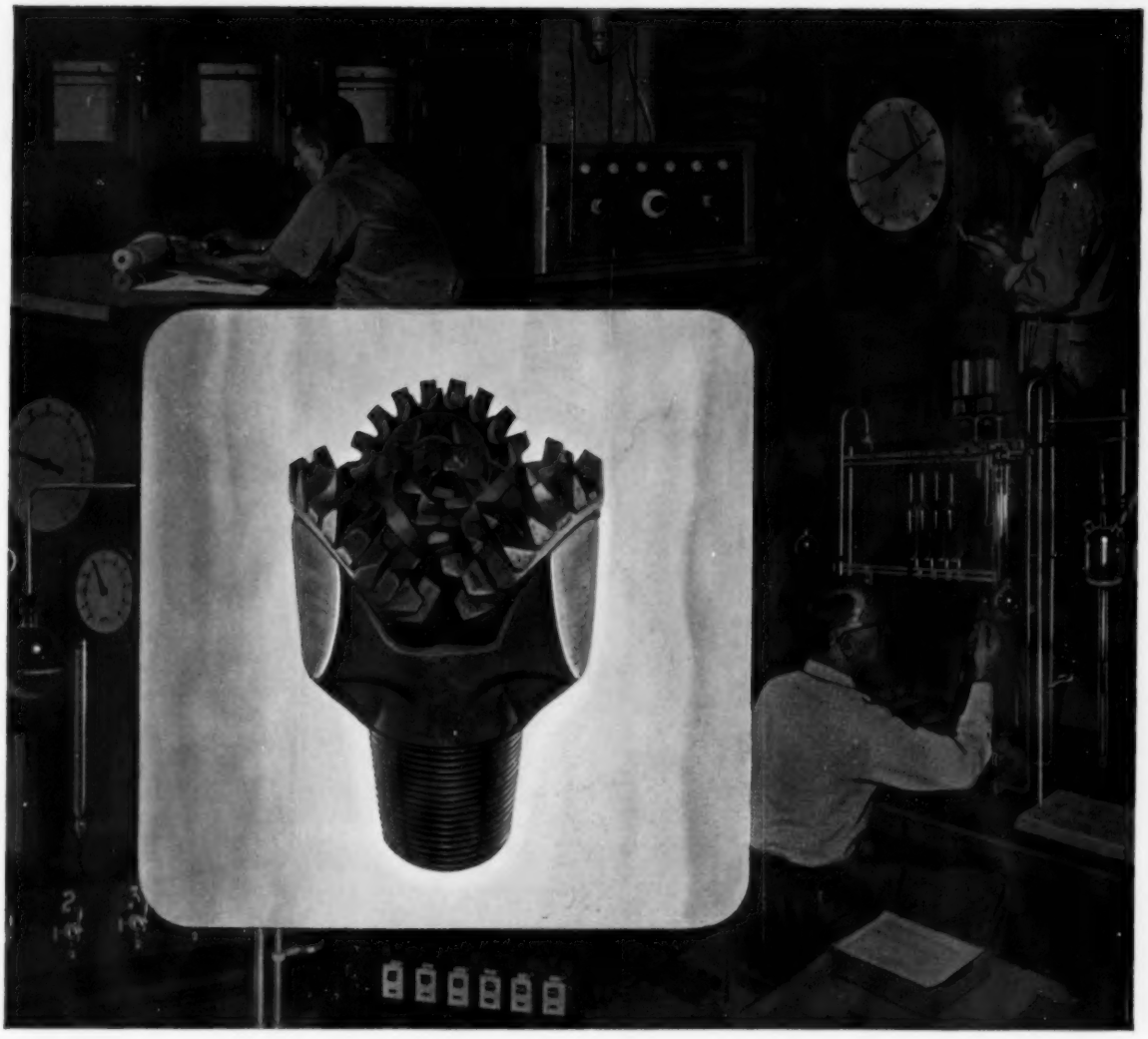
The Federal-aid system of secondary or farm-to-market roads is 482,972 miles in extent.

The program is under the supervision of the Bureau of Public Roads, Commerce Department, C. D. Curtiss, Commissioner.

British Columbia Cement Co. Reveals $4,000,000 Expansion

British Columbia Cement Company, Ltd., a subsidiary of the Associated Portland Cement Manufacturers, London, England, has announced plans for a 2½ year expansion program at its Vancouver Island, B.C., plant. The expansion, which will involve expenditures of approximately $4,000,000, will increase capacity from 2,200,000 bbl. to 3,200,000 bbl. annually.

Company officials said the present market in British Columbia can absorb about 1,800,000 bbl. a year and is expected to grow fast enough to take up the extra capacity when it is completed.



Controlled heat treating puts "muscle" in your bits

The metallurgical "muscle" and stamina that keep rock bits biting into formations longer come from accurately controlled carburizing and heat treating. In perfecting these operations Hughes Tool Company has developed the industry's most advanced heat treating processes and equipment. *Today, Hughes ranks as the largest deep case carburizer of manufactured products in the world.*

Back of every Hughes bit is the Company's 46 years' experience in making the industry's finest rock bits for rotary drilling.

Put the lid on DUST in your Plant...

with a Johnson-March low-cost Dust Control System!

For only 1/10 the cost of other dust handling systems, you can eliminate dust in your rock crushing, asphalt, limestone or cement plant with a Johnson-March engineered system.

These liquid systems stop dust right at its source—at primary and secondary crushers, conveyors, elevators, screens, loading and unloading bins, dryers and kilns, and other points where dust is created. Easy to install. No cumbersome equipment to interfere with your operation.

Whatever your application, let Johnson-March engineers analyze your operations and recommend a simple but effective low-cost system to end your plant and community dust problems. Mail the coupon today for prompt attention to your needs.

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1724 Chestnut St., Philadelphia 3, Pa.
At no obligation, please
☐ Send informative data on J-M dust control systems.
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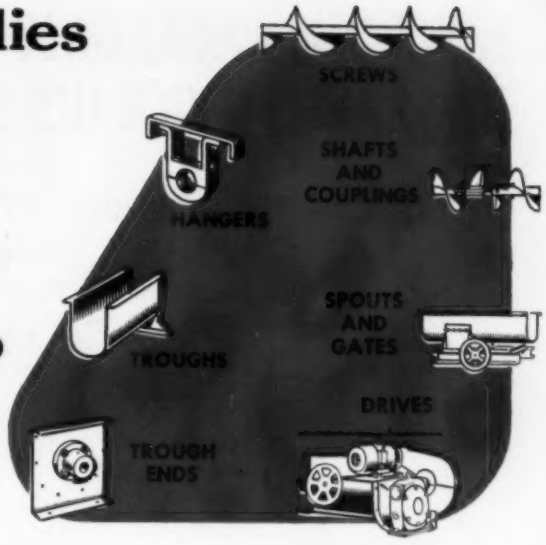
CANADIAN REPRESENTATIVES: G. F. Sterne & Sons, Ltd., Brantford, Ontario

How Link-Belt applies STANDARD or SPECIAL screw conveyors to meet your needs



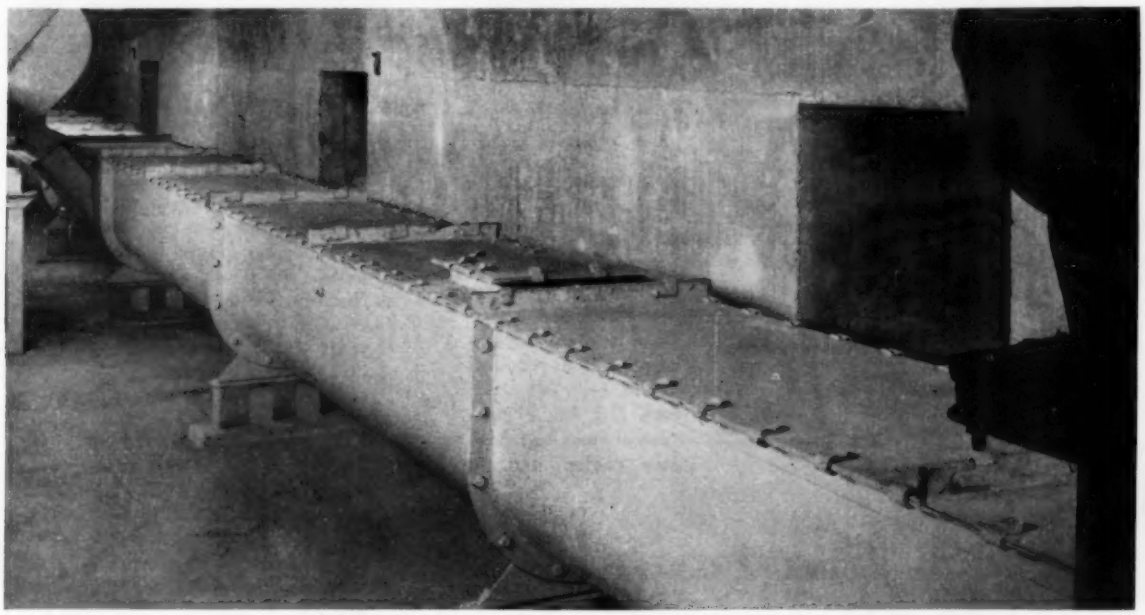
This 4-phase service saves you time . . . spares you details

ANALYSIS AND ENGINEERING service is provided by a district sales office in your area. From long experience, Link-Belt District Engineers can quickly ascertain the best conveying arrangement for you.

COMPLETE LINE OF SCREW CONVEYOR COMPONENTS and related elevating, conveying and power transmission equipment is your assurance that specific needs are fulfilled efficiently and economically.

EASY ERECTION is achieved because of pre-fitting, match marking, close-tolerance manufacturing and Link-Belt drawings. Link-Belt will handle erection if you wish.

SATISFACTORY PERFORMANCE is assured when you rely on Link-Belt as a single contract source for your complete system. We will accept full responsibility for placing it in operating readiness.



Link-Belt 20-in. dia. screw conveyor handles 500 barrels per hour of finished cement from storage silo to cement pump to barges.

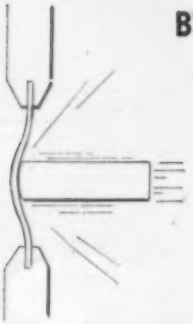
Extensive engineering experience has provided Link-Belt with standard solutions to specialized screw conveying requirements. In addition, local availability of Link-Belt engineering service and quality components assures prompt, efficient action. That's why—whether you plan a complete new system or improvement of present arrangements—a call to your nearest Link-Belt office is a sure step to lower handling costs.

LINK-BELT

SCREW CONVEYOR EQUIPMENT

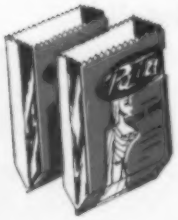
LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,912-A

HOW ONE PACKAGING MAN SAVED TWICE HIS SALARY



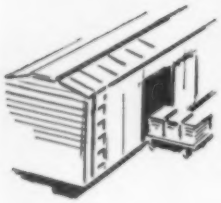
BY CUTTING BREAKAGE LOSSES

Reducing breakage is a T-P specialty. By specifying T-P Quality Shipping Sacks, this expert got extra strength without extra cost. Breakage losses were reduced to a minimum—production increased. (Large quantities of T-P Extra Strength papers are made into shipping containers by other manufacturers.)



BY DESIGNING FOR THE JOB

He found that T-P experts cut his costs by putting modern thinking into package redesign—both from production and appearance standpoints . . . that he received consistant high quality reproduction. (T-P maintains complete design, plate and printing shops staffed by the industry's finest craftsmen.)



BY MAINTAINING STOCK CONTROL BALANCE

He found he had a full line to choose from — from 2 to 100 lbs. in every style and type—one to five walls. He could order as his operations required —mixed carloads to keep his stock control in balance. (T-P has a complete line with special liners—asphalt, polyethylene, clay coated, etc. to suit any need.)

BY SPECIFYING

tp

Quality Shipping Sacks

Thomas Phillips COMPANY AKRON, OHIO

For 83 Years a Leading Supplier of Shipping Sacks for Agriculture and Industry

Kaiser Builds Second Plant In California, Replacing Facility Destroyed by Fire

A fire of undetermined origin almost completely destroyed Kaiser Gypsum Company's Redwood City, Calif., gypsum wallboard plant on June 23, 1955. Replacement value for the facility was set at approximately $2,500,000.

There were no injuries to the personnel at the plant; about 130 persons are employed on a three-shift basis. The fire was brought under control 45 minutes after it started by the combined efforts of 50 fire fighters and another 50 workers from the plant. Production of gypsum wallboard at the plant totaled 94,000,000 sq. ft. annually.

Claude E. Harper, vice-president and general manager, announced on July 26 that Kaiser will build a second gypsum products plant at Pittsburg, Calif., to replace the razed facility at Redwood City. The new plant is expected to be put into production by December at the annual rate of 94,000,000 sq. ft. of gypsum board products.

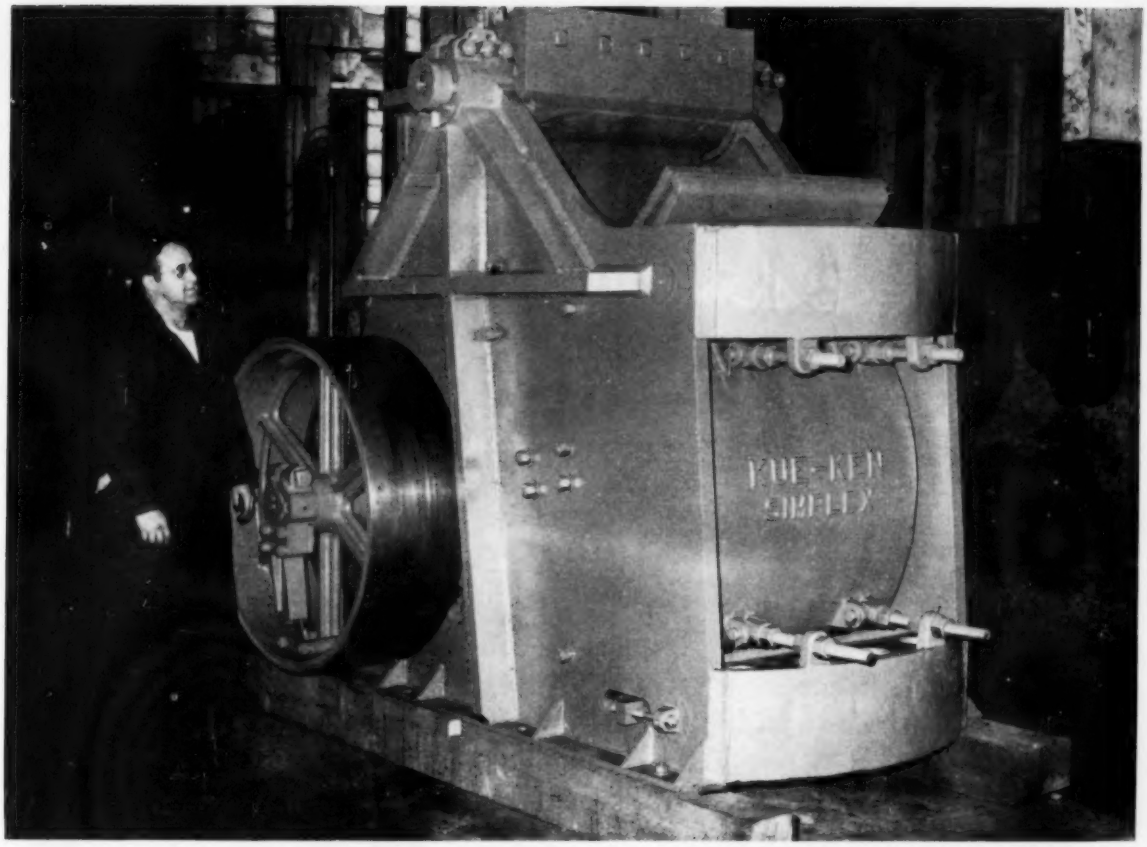
Construction of the new plant will be next to a larger, $5,000,000 gypsum products plant previously announced and due for completion next summer. At that time, the two operations will operate simultaneously, with a combined annual capacity of 274,000,000 sq. ft. of gypsum board products and 20,000 tons of plaster.

"We are not rebuilding the Redwood City plant," said Mr. Harper, "because we have a non-renewable lease on the land with less than four years to go. The cost of reconstruction there would not be justified for the short time remaining."

N.Y. Trap Rock Executives To Travel by Whirlybird

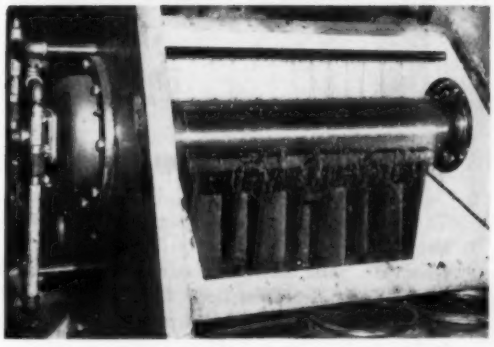
Air-minded executive personnel at the New York Trap Rock Corporation will be able to indulge their wish to soar through the air with the greatest of ease, for the company recently purchased a Bell Model 47G helicopter.

Commuting between the four New York Trap Rock plants at Haverstraw, Clinton Point, Tomkins Cove, and Verplanck, N. Y., will be greatly facilitated for executives in supervising operations. According to Wilson P. Foss III, president of the company. travel *via* the three-seater 'copter will make it possible to visit all four plants within one morning. By automobile such a trip requires at least a full day.



KUE-KEN CRUSHES ROCK FASTER and at LOWER COST! than any other jaw crusher

Kue-Ken operates at 375 rpm to provide 25% to 50% more capacity and a more cubical product. It is the lowest priced crusher per ton capacity. Overload cannot damage Kue-Ken . . . safety device instantly releases flywheel. No broken flywheels or bent shafts — no broken frames or toggles — no burnt out belts or motors!



Self-Lubricating!

Kue-Ken toggles do not wear out. They are machined, polished, flame hardened. They operate encased in a bath of filtered, dust-free oil that maintains their original micrometer tolerances for the life of the crusher. Photo shows Kue-Ken operating with cover removed to show filtered oil pouring over shaft, bearings and toggles.

• Write for catalog •

KUE-KEN CRUSHERS

"LOWEST COST-PER-TON CRUSHING"

Jaw Crushers · Gyratory Crushers · Overhead Eccentric Crushers · Revolving Screens
Classifiers · Feeders · Rib Cone Ball Mills · Concentrating Tables · Vibrating Screens

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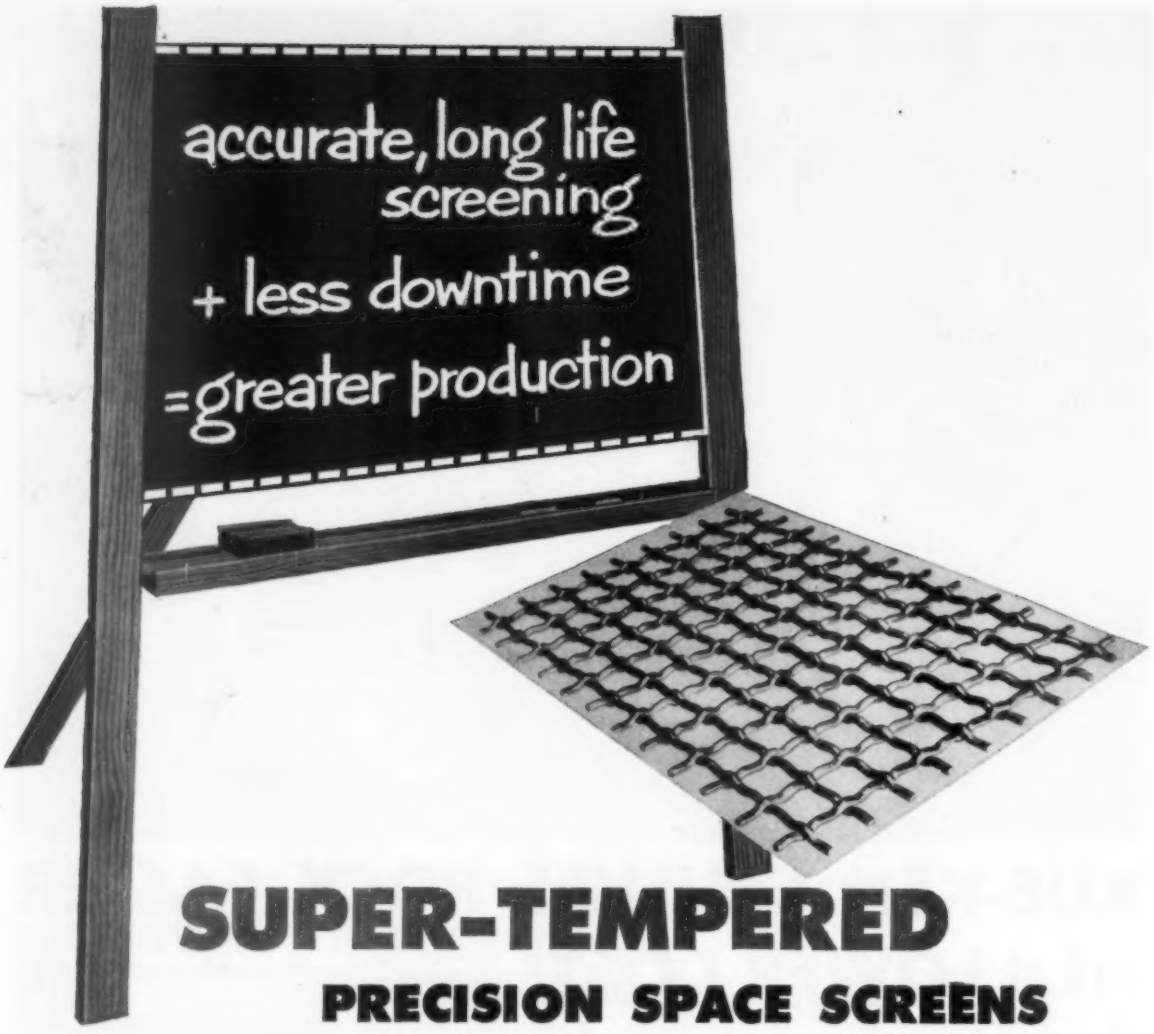
Pennsylvania Crusher Division, Exclusive Licensed Eastern Manufacturer and Distributor, 323 S. Matlack St., West Chester, Penn.
Armstrong Whitworth (Metal Industries) Ltd., Authorized Licensed Manufacturer and Distributor. Close Works, Gateshead-upon-Tyne 8, England



SUPER-TEMPERED
PRECISION SPACE SCREENS

assure greater tonnage output at a lower cost

To the casual observer, one space screen is pretty much like another. But, in terms of downtime, output and screen life, basic differences are readily apparent. That is why Super-Tempered Space Screens have long been standard on difficult jobs where costs are a determining factor.

These screens are made from special super-tempered wire, heated red-hot and oil quenched for extreme hardness. They are then tempered in molten lead to obtain the toughest structure possible. Finally, they are precision crimped and woven on powerful hydraulic looms to insure accurate, uniform spacing that withstands the severest vibration.

This superior screen offers you peak performance with positive savings on even your most demanding jobs. To order, write or phone your requirements to our nearest sales office.

THE COLORADO FUEL AND IRON CORPORATION—Denver and Oakland
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo
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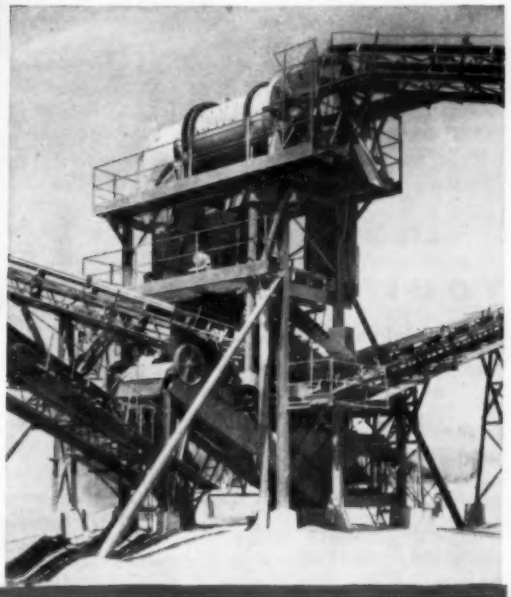
SUPER-TEMPERED
PRECISION SPACE SCREENS
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

CF&I

as modern as they come...

DESIGNED AND EQUIPPED BY TELSMITH

New Plant of L. Romano Construction Co., East Providence, Rhode Island, processes 200 tons per hour of washed aggregate—sand, and 3 sizes of gravel all under 1½″ and stockpiled. Telsmith designed the plant, and built the machinery. Send for Telsmith Complete Plant Service Bulletin 278.



Crushing Plant (*above*)—Plus 4″ gravel goes to a 18″ x 32″ Telsmith Jaw; plus 1½″ gravel to a 36-S Gyrasphere Crusher; the scalper is a 4′ x 12′ Telsmith 2-deck Vibro-King. **Washing Plant** (*right*) has a 72″ Telsmith Super-Scrubber; two 4′ x 12′ Telsmith 2-deck Vibro-King rinsing-sizing screens; 24″ x 20′ Telsmith Twin Screw Sand Classifier.

Many Features of Modern Design— In this plant both Telsmith Crushers are high capacity, low maintenance machines. The large-capacity Telsmith sizing screens have spray bars on every deck. The extra heavy-duty Telsmith Super-Scrubber takes out the clay as well as soft stone, assuring top quality aggregate always. Send for Telsmith Bulletin 266.

G-2A

SMITH ENGINEERING WORKS

504 E. CAPITOL DRIVE **MILWAUKEE 1, WISCONSIN**

Representatives in Principal Cities in All Parts of the World • **Cable Address: Songworks, Milwaukee**

THIS TRADEMARK

CONFIDENCE THRU INTEGRITY, QUALITY AND SERVICE • BUILDING

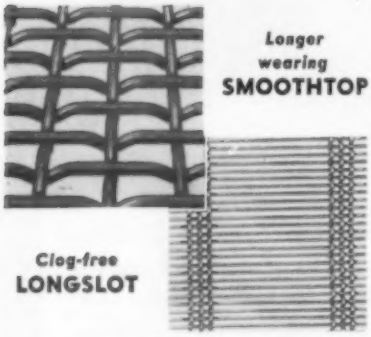
HOYT

ON YOUR

WIRE SCREENS

increases your profits

by delivering the lowest operating cost per ton of aggregate handled!



Longer wearing SMOOTHTOP

Clog-free LONGSLOT

DOUBLE CRIMP • OBLONG SPACE

Write today for a "test-and-see" trial installation.

HOYT WIRE CLOTH COMPANY
LANCASTER, PENNSYLVANIA

HOYT
AGGREGATE
WIRE SCREENS

Jan.-March Gypsum Output Highest First Quarter Total

Domestic mine production of crude gypsum during the first quarter of 1955, as reported to the U. S. Bureau of Mines, was 2,333,376 short tons—26 percent more than in the first quarter of 1954, and the largest tonnage ever mined in a January-March period. Imports during the first quarter of 1955 totaled 652,820 tons—30 percent more than imports in the first quarter of 1954, and a record high for imports during a January-March period.

For the third successive quarter production of the major gypsum products increased as compared to the same months of the previous year. The use of agricultural gypsum increased 53 percent, plate-glass and terra-cotta plasters were up 28 percent, and pottery plasters were 15 percent higher than in January-March, 1954.

The continuing trend toward premixed plaster was reflected in a 48-percent increase. All other classes of plaster except that going to mixing plants also gained substantially. Gauging-molding plaster reversed its downward trend of recent quarters.

For the fourth successive quarter a new record was established for wallboard. All other gypsum prefabricated products except sheathing were sold in considerably higher quantity than in the first quarter of 1954.

N. American Potash Deliveries Increase 8% Over Last Year

Potash deliveries in North America by the seven leading American potash producers set a new record of 2,164,997 tons of potassium oxide during the fiscal year June, 1954, through May, 1955, according to the American Potash Institute. This represents an increase of 8 percent over 1953-1954.

Potash for agricultural purposes in the continental United States amounted to 1,897,404 tons, an increase of more than 6 percent over the previous year. Illinois led the 46 states receiving shipments in the amount consumed.

Edmund Claxton, director of research for the Armstrong Cork Company, has been named president of the Building Research Institute, Washington, D.C., technical society for the building industry; and William Muirhead, president of the William Muirhead Construction Company, Durham, N.C., is the new vice-president.

$2,000,000 Expansion Plan For Garfield Plant Revealed By Western Phosphates

A $2,000,000 expansion project at its Garfield phosphates reduction plant has been announced by Western Phosphates, Inc., an affiliate of Stauffer Chemical Company, American Smelting & Refining Company, and Kennecott Copper Corporation.

The expansion program, to be completed late in 1956, will increase the plant's capacity by about 40 percent. Present input of rock at the plant, about 135,000 tons annually, would be raised to around 185,000 tons. The expansion would require increased mine production of phosphate rock from mines in southeastern Idaho, southwestern Wyoming, and northern Utah.

Products produced by the plant, including triple superphosphates, phosphoric acids, and ammoniated phosphates, will run between 150,000 and 175,000 tons per year.

Diehl, Tex. Cement Firm Head Has Long Cement Background

Kent Diehl Sr., newly elected president of the Texas Portland Cement Company, has had a long and varied background in the cement industry. He was formerly president and general manager of the Gulf Portland Cement Corporation of Houston, and is now assistant to the president of Kennedy-Van Saun Manufacturing and Engineering Company.

Mr. Diehl has served as special engineer to the Dewey Portland Cement Company and the Ash Grove Lime and Portland Cement Company of Kansas City, Mo. Supervision and engineering of portland cement plants in Mozambique, Africa, Italy, Southern France, Formosa, and Indonesia have been intrusted to him. Mr. Diehl is the inventor of the bulk oil well cementing process used by the Halliburton Oil Well Cementing Company throughout the world. He has served as a consultant on cement manufacture and cement plant building and operation for 11 foreign governments.

Universal Atlas Cement Company has applied to the Lorain, Ohio, city council for permission to build a $12,000,000 cement plant there. Approval is anticipated for construction of the plant on the banks of the Black River where the Baltimore & Ohio Railroad ore docks once operated.

PHOTO COURTESY HARNISCHFEGER CORPORATION, MILWAUKEE, WISCONSIN

Flexibility of Modern Chrysler High-Speed Industrial Engines Proved in 375 Ampere Arc Welder

Here pictured in construction is a New York City garbage disposal dump located on the North River near 135th Street. When completed, trucks will drive up its ramps and discharge loads into cubicles located over scows. Scows will then convey refuse to a watery grave.

On this job, three P&H WN-302 Arc Welders have been putting in five 8-hour days every week welding cubicles, not only joining steel members but also giving them added strength for years to come. Chrysler Ind. 30 Engines power Harnischfeger 375 Amp. Welders supplying enough extra power to compensate for possible generator loss and still provide reserve for overload.

Within their 230 to 413 cubic inch displacement range, Chrysler Industrial Engines offer the high-speed performance construction equipment demands. Each engine is a compact, relatively small unit which will permit installation in virtually any type of construction equipment regardless of size or silhouette. Besides size, weight and cost advantages, should it become necessary, Chrysler Industrial Engines offer fast, easy parts replacement service with dealers located all over the country.

In considering power for your equipment, remember Chrysler offers its industrial engines built to meet the needs of the equipment with such items as gyrol Fluid Coupling; Chrysler Industrial Torque Converter; 3-, 4- or 5-speed transmissions; heavy-duty clutch and power takeoff; velocity, belt or gear-driven governors; gas, butane and propane burning carburetors available for factory installation.

With Chrysler Power too, you do not pay a premium. Production-line methods adapted to specialized industrial engine building provide a custom-built Engine at mass-production prices. See a Chrysler Industrial Engine Dealer or write: ***Dept. 139, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.***

CHRYSLER INDUSTRIAL 30 Engine
230 cubic inch displacement

CHRYSLER ***Industrial Engines***

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

HORSEPOWER WITH A PEDIGREE

AGRICULTURE • INDUSTRY • CONSTRUCTION • OIL FIELDS

Two Ready-Mixed Firms Join Forces to Build New England Cement Plant

Directors of E. L. Dauphinais, Inc., and the Rosenfeld Sand and Stone Company, two Worcester County, Mass., ready-mixed concrete producers have announced their firms will form a corporation to build and operate a $10,000,000 cement mill in northern New England.

Construction plans have already been drawn, and building was expected to begin in the near future. The operation will be erected on a 300-acre limestone deposit somewhere in Maine, New Hampshire, or Vermont, but the firms declined to state the specific location.

Employing about 350 workers, the facility is expected to produce approximately 4,500 to 5,000 bbl. of cement daily.

The Certain-Teed Products Company, Fort Dodge, Iowa, has made option agreements pending land tests with the owners of 80 acres of land near the firm's present gypsum quarry. Purchase of the land will be at a price commensurate with the percentage of gypsum rock found on the property.

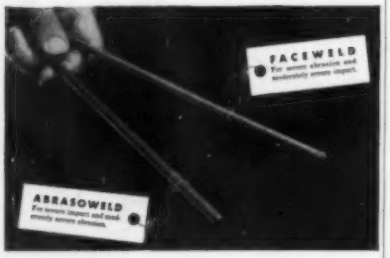
How to put more bite in dipper teeth

. . . and save money besides

Your dipper teeth will dig longer, work harder when faced with Lincoln Hardsurfacing.

And, your Hardsurfacing will cost less.

Now . . . only 2 electrodes, Abrasoweld and Faceweld, handle all your needs. So you cut inventory costs.



Pound for pound, Abrasoweld and Faceweld cost less.

So why pay high prices . . . when you get more wear per dollar with Lincoln.

GET THESE HARDSURFACING FACTS. Write for Bulletin SB-1352.

THE LINCOLN ELECTRIC COMPANY

Dept. 5204 • Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

Lehigh Starts Excavating Quarries in Pennsylvania For Limestone Reserve

Lehigh Portland Cement Company has begun excavating work on quarries which it is establishing on 340 acres of land purchased in Forks Township, Pa., during the last year.

John C. Shumberger, the firm's director of properties, said that several quarries are to be worked because the land purchased does not contain a continuous belt of limestone.

The total paid for land in the county to date amounts to $352,196. Mr. Shumberger commented that the land was purchased to supplement the reserves of limestone used by the company. He said it is the policy of Lehigh to have reserves of limestone sufficient for 50 to 100 years.

Limestone taken from the Forks Township quarries will be transported to the Sandt's Eddy, Pa., plant for processing. There are no plans for plant construction at the quarries at the present time.

American Sulphur Refining Co. Utah Plant Starts Production

American Sulphur Refining Company's new $1,100,000 sulphur refining plant has begun operation at Sulphurdale, Utah.

Officials of the company said production is being maintained at 100 tons a day, and output is 99.7 percent pure. The deposits are located on 7,000 acres of land that has been leased. Construction of the plant was begun in 1954.

Total proved ore to date is said to be 3,900,000 tons, and total sulphur content is estimated at 730,250 long tons.

Kerr-McGee Oil Plans to Drill For Potash in New Mexico

Kerr-McGee Oil Company has announced that it would begin work on its first shaft to mine potash in Eddy County, N.M., in September, 1955. Company officials said that they have received assurance of cooperation from local authorities in expediting construction of a road to the location.

The firm has leased about 13,000 acres in Eddy and Lea Counties, and is the seventh company to enter the Carlsbad potash basin. Officials plan to ask bids for sinking the 15-ft. shaft 1,600 ft. in the near future. Enough ore is expected to be surfaced within a year after drilling starts to keep a refinery in operation.

DRAMATICALLY SUPERIOR hot-zone service

with Kaiser Periclase-Chrome Brick

THESE FIGURES were furnished by cement producers during a field check of rotary cement kilns now using Kaiser Periclase-Chrome burned brick. Plants checked have a total capacity of nearly 27 million barrels.

This dramatically improved service is possible because Kaiser Brick is *especially designed* for hot zone linings to provide great volume stability under loading, high resistance to spalling and to chemical attack by cement clinker at higher temperature. Think what this means in shutdowns eliminated!

In addition, Kaiser Periclase-Chrome Brick takes a good coating in the kiln, usually without inducement.

If you are not yet using Kaiser Brick, let us show you *now* how its superior performance can give you increased clinker production at lower cost!

Plant	Average service Kaiser Brick	Average service 70% alumina Brick	EXTRA SERVICE with Kaiser Brick
1	14 months	1 month	13 months
2	24 months	12 months	12 months
3	15 months	3 months	12 months
4	15 months	4 months	11 months
5	14 months	3 months	11 months
6	14 months	3 months	11 months
7	12 months	4 months	8 months
8	15 months	7 months	8 months
9	7 months	1 month	6 months
10	12 months	6 months	6 months
			Average: 9.9 months EXTRA SERVICE

Call or write Kaiser Chemicals Division, *Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway,* OAKLAND *12, California... Three Gateway Center,* PITTSBURGH, *Pa.... 518 Calumet Bldg., 5231 Hohman Avenue, Hammond,* Indiana (CHICAGO).

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Refractory Brick and Ramming Materials • Dolomite • Magnesia • Magnesite • Aluminas • Periclase

● Harold Biehm, owner of Blue Rock, Inc., Greenfield, Ohio, held Open House on July 22 and 23, 1955, by inviting the public to a tour of the plant. This photograph shows Jim Schwart, the plant manager, describing the limestone plant operation to the visitors who were transported in a wagon drawn by a tractor. This first Open House drew an estimated crowd of 300 persons.

FOR HIGHER THAN AVERAGE PRESSURES OF AIR, WATER

HAMILTON VARI-PURPOSE Industrial HOSE

OIL, SUN AND ABRASION-RESISTANT COVER

Tough, abrasion-resistant cover inseparably bonded to a specially compounded, oil-resistant tube, reinforced with highest quality CORDURA rayon yarn.

A single hose to handle almost any maintenance job. Tough, resilient, durable; will carry a wide range of materials. A general purpose hose of long life and low net cost.

Available in standard lengths. Red or black covers. Sizes ¼" to 1½" I.D. with working pressures 125-300 pounds. See your local distributor.

OTHER HOSES FOR SPECIFIC INDUSTRIAL NEEDS

Acid
Air
Chemical and booster
Contractors
Creamery
Dredging sleeves
Fire
Forestry
Mill
Oil Suction & Discharge
Paint Spray
Pile Drivers
Road Builders
Rock Wool
Sand Blast
Spray
Steam
Suction
Tank Truck
Vacuum
Vacuum Brake
Water
Water Discharge
Welding

ALSO BELTING, TUBING, MATS, PACKING AND FLEXIBLE PLASTIC PIPE

Be sure . . . use Hamilton . . . Always dependable!

OVER 85 YEARS OF SERVICE TO INDUSTRY

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Cedarapids "Commander" Processing Aggregate At GM's Powerama

A group of spectacular and informative exhibits of construction and road building machinery which has been assembled for the general public will include a Cedarapids Commander portable crushing and screening plant demonstrating actual aggregate crushing technique. This section of General Motors' Powerama which opens on Chicago's lake front August 31 for a 26-day run will include practically every type of equipment used today in the building of American roads at stages ranging from rough terrain to finished concrete and asphalt surfaces.

Since it is impossible to show actual working units of all equipment, a Cedarapids Commander will demonstrate the application of diesel power on portable crushing plants in the construction industry. The plant, equipped with a GM diesel engine, will be in actual operation for ten minutes of each hour the exposition grounds are open. The aggregate to be crushed will be trucked in daily from one of Chicagoland's quarries.

A big ramp built alongside the plant will enable everyone to watch the flow of material from the feeder, across the vibrating screen, through the crushers, and over the conveyor belts.

There will be no dust problem, thanks to the ingenuity and cooperation of the Johnson-March Corporation, dust control engineers of Philadelphia. They have provided a system of fine spray nozzles to spray a mixture of water and wetting agent compound onto the material as it passes across the feeder, through the crushers and elevating wheel, off the conveyors and into the bins. No free water will be able to accumulate on the ground.

Other construction equipment to be displayed will include power shovels, earthmoving, drilling, grading, loading, compacting, mixing and paving equipment. Each unit will be "stopped" in a realistic pose to show the particular job it performs.

The Ace Sand and Gravel Company has begun operations of their gravel pit near Deridder, La. About 12 men are working in the plant, and 65 men are employed in all phases of the operation. Approximately 800 yd. of gravel are produced daily, and the estimated payroll is $100,000 annually. E. T. Olsen is president of the firm and Phil Olsen is vice-president.

STAYS STABLE ...Hot or Cold!

Sinclair JET LUBRICANT won't thin out at high temperatures. It maintains lubrication at frigid temperatures. This superior product stays put on heavy exposed gears and circle tracks. It resists wash-out, throw-out and drip.

JET LUBRICANT saves money, too, because it lasts longer . . . reduces lubricant consumption . . . helps to lower power consumption. No heating is required to make it usable direct from its container.

There are *more* reasons why the right grade of JET LUBRICANT and other Sinclair products can improve your operations. Why not let a Sinclair Lubrication Engineer help solve *your* lubrication problem. *There's no obligation.* Contact your local Sinclair office or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N.Y.

SINCLAIR JET LUBRICANT

30 Years ago in Pit and Quarry

THE MAJOR articles in the September 1 and 15, 1925, issues of PIT AND QUARRY illustrated well the wide variety of industries which even then formed the nonmetallic minerals industries. Operations described in those issues included outstanding plants producing sand and gravel, cement, lime, diatomaceous earth, dimension stone, and ready-mixed concrete. Other types of articles also dealt with the gypsum, crushed stone and other industries. The September 15 issue was devoted almost entirely to operations on the Pacific Coast which was then just beginning to boom industrially. This was PIT AND QUARRY's first annual Pacific Coast issue, a practice which was continued for many years.

The feature article of the September 1 issue described the already widespread operations of the Colonial Sand & Stone Co., New York City, then as now one of the world's largest distributors of building materials. At that time the company produced none of its raw materials as it now does. It operated a fleet of 100 delivery trucks and the article described in detail the company's maintenance and repair program for this large fleet. A large part of the company's sales of aggregates at that time was for subway construction. Officers of tne company were: L. Ruckeyer, president, and Generoso Pope, secretary-treasurer.

Another article described the new cement plant of the Standard Portland Cement Co. (a subsidiary of the Diamond Alkali Co.) at Fairport, Ohio. Conditions for such a plant were highly favorable as the parent alkali company already had in operation for its other plants raw material docks and handling and preparation facilities, a coal grinding installation, a powerhouse, excellent rail shipping facilities, etc. Also, in the preparation of crushed stone for its other operations, a large amount of unusable fines was produced which made ideal cement raw material.

Two cement plants in the Pacific Northwest were also described—those of the Superior Portland Cement Co. at Concrete, Wash., and the Oregon Portland Cement Co. at Oswego, Ore. A feature of the Superior plant was a new 7,600 ft. aerial tramway from the quarry to the plant. The Oregon plant was located only 10 miles from the heart of Portland and stone was brought in by rail from a quarry 50 miles away. The officers of the Superior Portland Cement Co. were: John C. Eden, president; James R. Stirrat, vice-president; S. L. Barnes, secretary; and A. A. Sutherland, treasurer. Gordon Tongue, now president of the Northwestern Portland Cement Co., Seattle, Wash., was sales manager; William Jennings, manager; C. L. Wagner, superintendent; and H. A. Ambler was chemist. Officers of the Oregon Portland Cement Co. were: R. P. Butchart, president; L. C. Newlands, vice-president and general manager; Carl W. Gath, secretary-treasurer. D. H. Leche, plant superintendent and general chemist, is now vice-president and general superintendent.

The lime industry was represented by a trio of outstanding operations. The new plant of the Batesville White Lime Co. at Limedale, Ark., had three 600-bbl. per day wood-burning shaft kilns and a large continuous hydrator. Officers were: W. W. Fischer, president; W. N. Fry, vice-president; W. F. Perrin, secretary; and G. T. Weigart, treasurer and general manager C. B. Teague and C. Morris were superintendents. The Connecticut Lime Co., Canaan, Conn., operated an efficient plant with six vertical coal-fired kilns producing 120 to 170 bbl. per day each. The third plant, and the largest on the Pacific Coast, was that of the Roche Harbor Lime & Cement Co. at Roche Harbor, Wash. This plant was completely destroyed by fire in 1923 and was gradually rebuilt.

The diatomaceous earth plant described was that of the Monterey Products Co. at Monterey, Calif. Most of its output was being used in concrete. The sand and gravel plant described was that of the Service Rock Co. near Fresno, Calif. This plant was a pioneer in the use of hydraulic sand classifiers and in the recovery of gold. About $100 worth of gold was recovered in 12 hours of operation.

Special articles included the first installment of a notable series on gypsum quarrying, manufacture, and uses by George O. Gray. Another series on lime quarrying, manufacture, and use was started by Burton B. Pierce. Chester N. Reitze, now president of Superior Portland Cement Co., Seattle, was the author of a series on *Stone That You Can Mould*, in other words, concrete.

Other special articles included *Reclaiming in the Cement Industry* by C. H. Sontag; *A Survey Concerning Night Operation* by R. N. Van Winkle; and *Freight Rate Problems in the Non-Metallic Industries* by L. E. Whitney.

In the list of recent patents granted were such names as: John W. Page, Chicago, (scraper bucket); Alvah D. Hadsel, San Francisco, (rock crusher); Walter J. Mullally, Chicago, (excavating teeth); and William S. Weston, Columbia, S. C., (gyratory crushing machine).

Hawkeye-Marquette Reveals Des Moines Plant Expansion

G. Frank Hetherington, president of the Hawkeye-Marquette Cement Company, announced recently that the firm's Des Moines plant will be expanded to produce another 500,000 bbl. annually by mid-1956, if possible. The operation increased its production from 900,000 bbl. to 1,900,000 bbl. in 1951.

The present program, Mr. Hetherington commented, was undertaken, in part, to meet requests of the Iowa Highway Commission for enough cement to get 628 miles of primary paving widening completed as quickly as possible.

Natl. Safety Council Issues Speech Training Manual

A Pocket Book of Speech Formulas—a new training aid for foremen and other supervisors—has been published by the National Safety Council, 425 N. Michigan Avenue, Chicago 11, Ill.

Written by Lester Lyle McCreary, professor of speech and English at California Institute of Technology, the 36-page illustrated manual presents ideas that will assist anyone called upon to give a safety talk.

The *Pocket Book of Speech Formulas* is available to Council members for 60 cents per copy and to nonmembers for $1.20.

OWNERS REPORT THE DECISIVE DIFFERENCE IN NEW

TD-18A Performance

"It can self-load and deliver fastest" "International TD-18A improvements like the new 300% stronger track frames and cartridge-type roller seals increase production, machine life, and operating ease. As for power, our new TD-18A can self-load the 8-11 cubic yard scraper and deliver fastest of any crawler we ever had." *Here's proof extra traction matches the TD-18's power increase!* G. W. Owen, McDonough, Ga.

"Every load's a payload" "My TD-18A International-Drott is built for the operator's comfort. I know, because I'm the operator. It has 360° visibility which no other loader has. Every load is a payload." *No other outfit built gives you the TD-18's combination of power, visibility and responsive controls.* V. S. Steffes, Owner, Earthmoving and Clearing, Batavia, Illinois.

"Operators fight for new TD-18A!" "The TD-18A's were always good—fast, trouble-free performance and low operating cost made me money. The new model TD-18A is stronger and really planned for the man in the seat. It has operators fighting for it." Big, wide, comfortable cushions; hydraulic steering control boosters, and levers, conveniently grouped on the roomy, non-skid deck! *No wonder TD-18A handling ease turns "skinners" into high-producing operators through-out the day!* M. B. McKee, McKee Construction Co., Chickasha, Oklahoma.

"Uranium search toughest of all!" "I'm in the hardest work I know of—building roads into uranium claims, rim-cutting development work. The TD-18 we used for six years had the motor overhauled after five years, and when we traded a year later the transmission and drives were still original equipment. I believe this heavied-up new model TD-18A is by far the best of all." *Advances like the new bridge-strong welded track frames, stronger transmission and exclusive cartridge-type track roller seals back his judgment.* O. Frost Black, Owner, Blanding, Utah.

Ease into the foam-rubber-padded, panoramic-vision seat and see the *decisive difference*. Try new finger-tip power steering, and other big *job-easing incentives* for boosting production, as developed only by International. Prove TD-18A *full-power traction*—note, too, how the gear train is beefed-up to transmit 103 drawbar hp, and then some! Measure what new *300% stronger track frames* mean *for full-capacity performance* under slam-bang conditions. Compare how new *cartridge-type track roller seals*, and other International *downtime-prevention engineering*, beat anything else on tracks. Ask for a new TD-18A demonstration!

INTERNATIONAL HARVESTER

INTERNATIONAL®

INDUSTRIAL POWER

MAKES EVERY LOAD A PAYLOAD

General view during construction showing expansion of facilities for greatly increased production

When Somerset Crushed Stone, Inc., first planned their present expansion program, they knew that more machinery and equipment would be required. As a result they checked a 10 year maintenance and production record on their KVS equipment.

The figures shown were so satisfactory and operating costs so low, they *again* chose Kennedy machinery . . . additional primary and secondary Gyratory crushers, screens, elevators and all auxiliary equipment needed to make their modern plant at Bernardsville, N. J., one of the largest aggregate producers in the State.

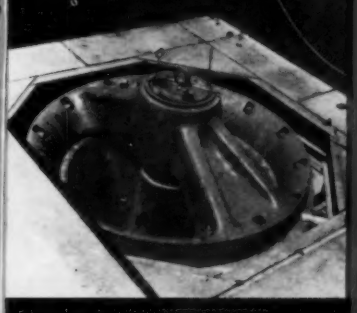
KVS engineers recommended the right equipment . . . developed flow charts . . . helped Somerset plan their new plant that exceeds rated capacities in all departments and operates at costs that are lower than original estimates.

If you are planning expansion or modernization of an existing plant or contemplate erecting a new one, consult KVS—Our engineers are available any time, anywhere, to show you that KVS has the *right* equipment for any job.

KENNEDY-VAN

MANUFACTURING AND ENGINEERING CORPORATION

Mammoth cranes used in erecting Kennedy 36 inch primary gyratory crusher



Giant receiving opening in new Kennedy 36 inch primary gyratory crusher

SOMERSET CHECKED THE RECORD

and again chose

KENNEDY

machinery and equipment

KENNEDY PRODUCTS

- Gyratory Crushers
- Swing-Jaw Crushers
- Tube Mills
- Ball & Rod Mills
- Vibrating Screens
- Rock Feeders
- Air Swept Tube Mills
- Rotary Kilns
- Coolers, Dryers
- Preheaters, Deheaters
- Belts, Conveyors
- Pneumatic Transport Systems
- Asbestos Plants
- Complete Lime Plants
- Complete Cement Plants
- Steam Generators
- Complete Aggregate Processing Plants
- Waste Heat Boilers
- Pulverized Coal Firing Systems

Send for bulletins describing KVS machinery and equipment.

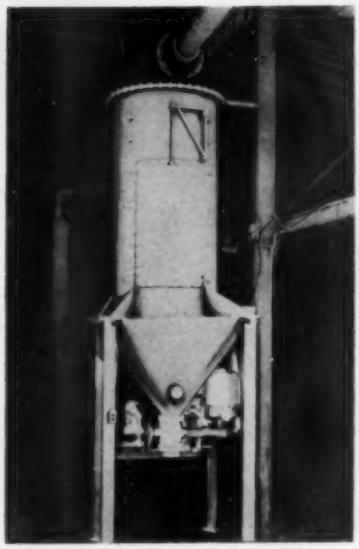
SAUN

2 PARK AVE., N. Y. 16, N. Y. **FACTORY: DANVILLE, PA.**

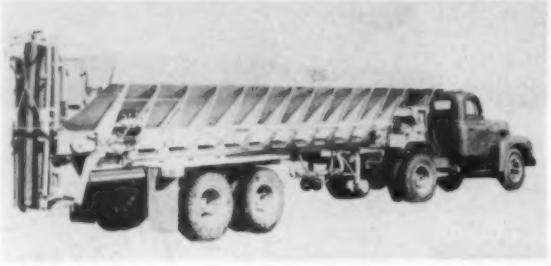
New Machinery and Equipment

(For more information, use card on p. 103)

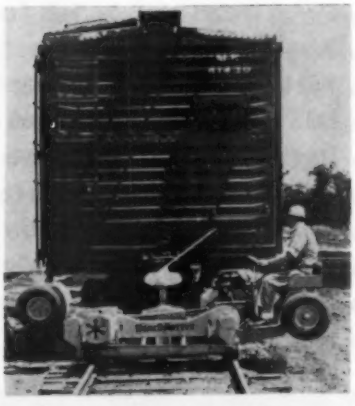
● Anthony Model JRB rock body of 8 cu. yd. capacity 12 ft. long with a Teleramic Twin "out mount" hoist of 25-ton capacity. The Anthony Company's new hoists enable the trucker to haul up to 1000 lb. or more additional payload on every trip, and are available for all trucks, straight, six-wheelers and semi-trailers up to 18-ft. bodies. ← (51)



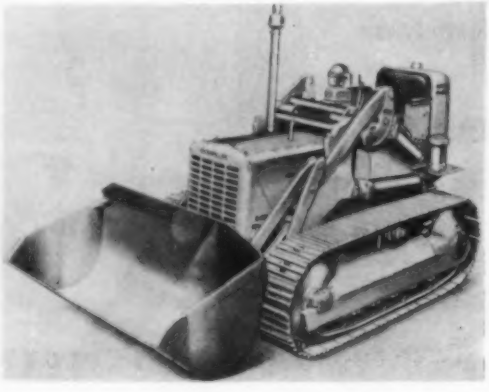
● A new power-driven dust collector and fractionator has recently been introduced by Majac, Inc. Design simplicity of the new machine results in minimum operating and maintenance costs, yet high efficiency is attained. The machine can be operated either as a dry or wet collector and has no expense of bags. Thirteen capacities from 300 to 30,000 c.f.m. of gas throughput, are available, with total horsepower of only 15 being used on the largest machine. The manufacturer will furnish literature and information relative to use of a model for testing purposes, upon request. In wet collecing it will remove particles down to 5 micron, with 100% efficiency in many operations. ↑ (52)



● The new Henderson "Chief" bulk transport is especially designed for easy one-man operation. It meets the demand for faster, more flexable delivery of bulk materials to eliminate handling and warehousing. A 14-ft. swivel conveyor swings in a 156-deg. arc around the back of the transport. Hydro-Mech action raises, lowers or folds the conveyor vertically. These trucks are available in 18-ft. to 36-ft. lengths. Rear feed-gate opening is hydraulically operated to control flow of material. The unit is equipped with a 15-hp. Wisconsin motor and extra-heavy-duty chain drive. A hydraulically-operated adjustable false floor reduces weight on the conveyor belt. The hopper is of corrosion-resistant, all-steel construction. Additional information and prices are available from the manufacturer. ↑ (53)



● The Hemco-Motive roadable-type rail car switcher utilizes the car weight through weight transfer, to obtain traction. It is equipped with a positive coupler for connection between the unit and the rail car, which allows easy coupling to either side. A fluid drive permits easy starting, saves power train from sudden shock loads, which means lower maintenance. It develops a 7,400-lb. drawbar pull and can propel 3 loaded cars. The fluid drive relieves the driver of tricky co-ordination usually needed to start heavy loads. ↑ (55)



● Caterpillar's new No. 955 Traxcavator using a 1½-cu. yd. bucket loads easily and fast, retains its load without excessive spillage, and affords maximum life with minimum maintenance. The bucket may be tilted back from any position as much as 40 deg. at the ground line. Advantages include lower cycle time in stock pile loading, controlled depth of cut in excavating or stripping, simultaneous horizontal tractor push and upward thrust, alternate tilting and leveling of bucket while pushing. → (54)

Production and Profits Go Hand-in-Hand with Traylor TY Reduction Crushers

Owners of Traylor TY Gyratory Crushers know that increased production means increased profits. They know that the exclusive design features and extra-heavy construction of a Traylor TY combine to boost production tonnage, reduce down-time and cut maintenance costs. As a direct result, profits go up hand-in-hand with the increased hourly output of a Traylor TY.

Furthermore, a Traylor TY's original, self-tightening bell head, with unique spring suspension, and curved concaves apply crushing power more efficiently. Increased capacity of each succeeding zone in the crushing chamber permits finer settings without choking or packing to produce greater tonnages with less power.

The compact design of a Traylor TY incorporates maximum strength with utmost simplicity of operation. TY Reduction Crushers are available in six sizes with feed openings from 3″ to 22″. Send for descriptive bulletin.

TRAYLOR ENGINEERING & MFG. CO.
1706 MILL ST., ALLENTOWN, PA.
SALES OFFICES: New York • Chicago • San Francisco
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A Traylor leads to greater profits

Primary Gyratory Crushers

Rotary Kilns

Secondary Gyratory Crushers

Ball Mills

Jaw Crushers

Apron Feeders

NO STOP SIGNS

For uninterrupted traffic in air or water, there's no better vehicle than Naylor light weight pipe. Naylor lines are easy to install, particularly with the Naylor one-piece Wedge-Lock coupling to speed connections. Naylor pipe gets around wherever you need it. Its light weight assures economy, and its exclusive structure provides the extra strength and safety required for dependable service. Sizes range from 4″ to 30″ in diameter with all types of fittings and connections.

Write for Bulletin No. 507.

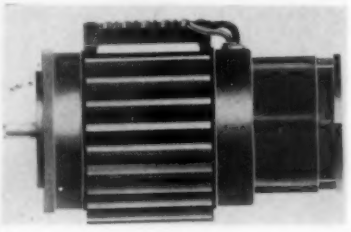
NAYLOR PIPE

NAYLOR PIPE COMPANY

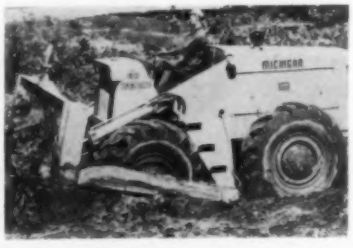
1257 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 350 Madison Avenue, New York 17, New York

● D. W. Onan & Sons, Inc. announce a new 15-hp. air-cooled Diesel engine to operate at 2,300 r.p.m. It is of 4-cycle, solid injection, and two-cylinder design, eliminating radiator, fan-belt, etc. It weighs 516 lb. and has full pressure lubrication. A 12-volt battery-charging generator and electric starter are standard equipment. The engine was formerly manufactured as the prime mover on the company's 5,000 watt diesel electric generating plant Model 5DRP. A throttle lever template and timing gauge are utilized. (56)



● A new 35-watt, 2-phase, a.c. servometer-tachometer generating unit operating on 60 cycles is announced by Diehl Mfg. Co. It can be used to regulate the speed of a motor or to stabilize closed-loop systems. Mounted on a single shaft, backlash is zero. It is believed to be the first motor of its kind and rating to be integrally mounted with a tachometer generator and to be rated for continuous duty at rated output. (57)



● The Model 180 Turbo-Dozer, the first rubber-tired dozer powered by a turbo-charged engine, was just introduced by the Construction Machinery Division of Clark Equipment Co. It has a 165-hp. rating and a capacity of 2¾ cu. yd. Features include hydraulic controls, power-tilted bowl and a road speed of 27 m.p.h. Rear-wheel steering permits full power on wheels, even while turning. (58)

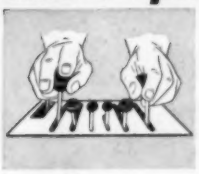
In every size, Link-Belt Speeder offers

more speed, stamina, power, work-time!

PATENTED SELF-CLEANING CRAWLER TRACK of LS-98 saves you money. Staggered shoe lugs and drive sprocket lugs force foreign material out, preventing excessive wear on drive mechanism—one of many bonuses.

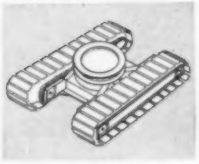
13,798

More speed—



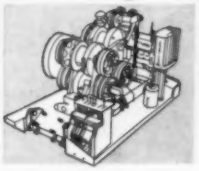
Speed-o-Matic, the true power-hydraulic control —smooth, positive response—perfect "feel" for speed with accuracy. Engineered to consider the human factor, greatly reduces operator fatigue.

More stamina—



A Link-Belt Speeder withstands continuous heavy-duty, high-speed operation. For proof, compare similar sized rigs with and without counterweights. Link-Belt Speeders have more "live weight", more strength built into every component.

More power—



Get more line pull, more digging power, lower fuel costs. Link-Belt Speeder design calls for precision-machining, anti-friction bearings and splined shafts at every point that helps transmit *rated hp* into *usable* hp.

More work-time—

A bigger percentage of shift is spent in actual "work-time." By minimizing operator fatigue, Speed-o-Matic boosts output up to 25%; also eliminates frequent on-the-job clutch adjustments and maintenance.

Visit your Link-Belt Speeder distributor and see these great machines first hand. A demonstration can be arranged at your convenience to prove that Link-Belt Speeder gives you most for your money.

You're ahead on every job—

because Link-Belt Speeder is *years ahead* of the shovel-crane industry. Only Link-Belt Speeder offers you Speed-o-Matic's true power hydraulic control and so many other outstanding design and construction advantages. For facts on every machine in the ½ to 3-yard, 10 to 60-ton work range, contact your Link-Belt Speeder distributor. Link-Belt Speeder Corp., Cedar Rapids, Ia.

LINK-BELT SPEEDER

Builders of a complete line of crawler and rubber-tired shovel-cranes

Drivers last longer...

when heavy-duty trucks use J-M Brake Blocks

Experienced operators know that when their vehicles are equipped with Johns-Manville Brake Blocks they can handle crushing loads without personal danger.

That's because these rugged, durable J-M Brake Blocks are engineered for the job . . . and designed for dependable performance plus maximum service life on trucks, shovels and heavy machinery.

They are "standard parts" on many famous makes of heavy-duty units. For fast, easy replacement, they are now available in Johns-Manville Assembled Sets that put new safety into your equipment.

See your Johns-Manville Distributor for data on J-M Brake Linings and Clutch Facings for industrial equipment, or write Johns-Manville, Box 60, New York 16, N. Y.

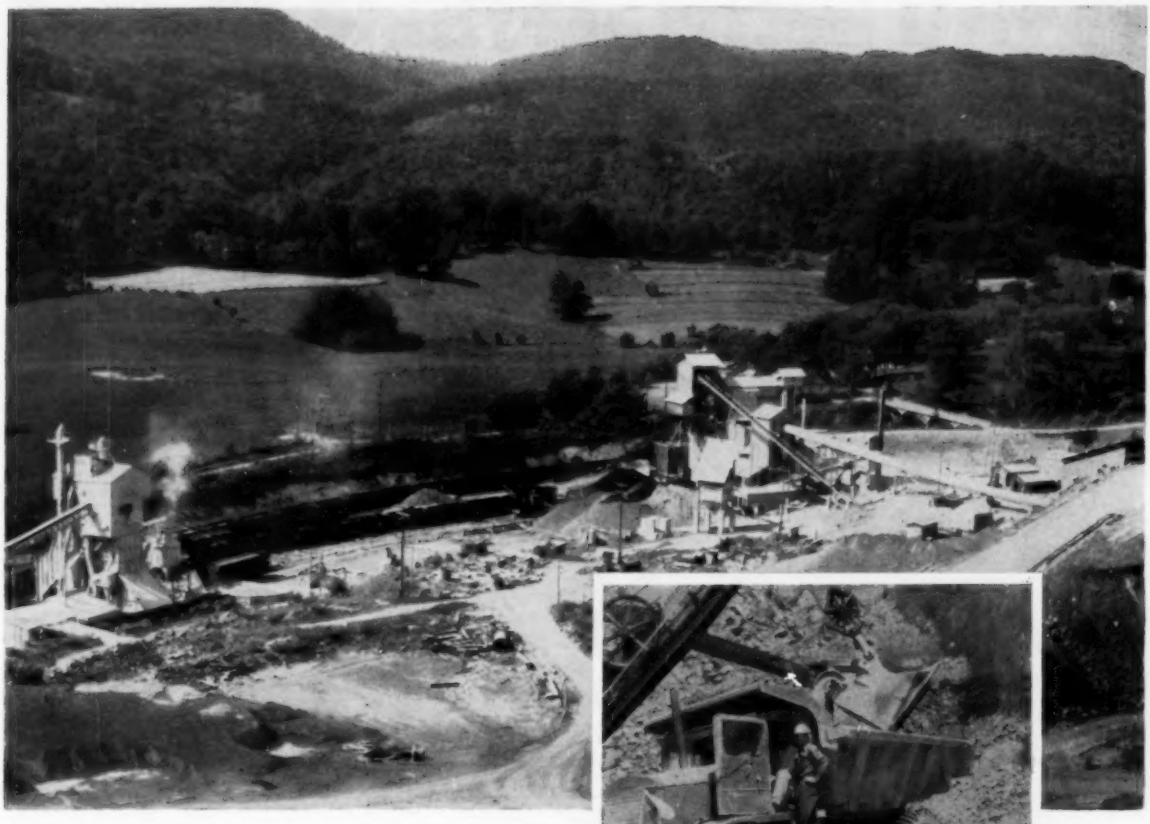
Johns-Manville Industrial Friction Sets are available in a wide range of molded or woven, rigid or flexible asbestos materials.

Johns-Manville
INDUSTRIAL FRICTION MATERIALS

● The Model 12-A Denver wet reagent feeder, designed by Denver Equipment Co., provides easier operation, lighter weights, laboratory accuracy and greater volume. The entire feeder is protected from foreign material. A 1/20-hp. motor and speed reducer with 100 to 1 ratio provide unvarying speed of disc rotation. Duplex feeders, acid-proof construction and heating units are optional. ▲ (59)

● Napco Construction Equipment, Inc., announces a new 15-cu. ft., front end loader, designated Model NL-50. It has front wheel drive and rear wheel steering and is designed to handle all bulk materials. It features a 7 ft. 4 in. turning radius, a low center of gravity and good balance, with a high lift of 7 ft. 6 in. and a capacity of 1,250 lb. Other features include: direct drive hydraulic pump, two forward and two reverse speeds, and a full line of accessories. ▲ (60)

● AiroViber vibrators, a product of Viber Co., can effectively move materials from a bin holding a load of 40 tons. Having only one moving part, a heavy steel ball running on a circular track, it can operate in temperatures approaching 750 deg. F. It exhausts through one side with special provision for deadening exhaust noises. ▲ (61)



Year in-Year Out...

Acme Limestone Company gets top equipment performance

with Gulf Quality Lubricants and Fuels

Equipment must operate like clockwork to produce 375 tons of crushed limestone per hour. And that's the way it works at this forty-year-old quarry of the Acme Limestone Company, Fort Spring, West Virginia, where Gulf Lubricants and Fuels keep shovels, cranes, drills, trucks, crushers, and other machinery operating at top efficiency.

In countless quarry operations Gulf Lubricants prevent excessive wear, keep maintenance costs at rock bottom levels. And Gulf fuels burn evenly and completely to insure top engine performance.

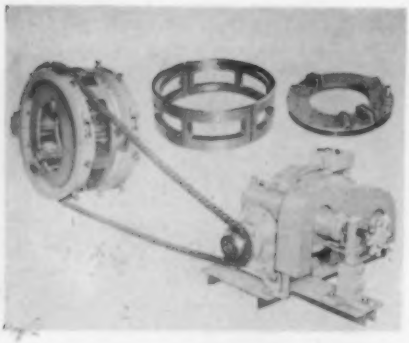
Then too, like the Acme Limestone Co., you will appreciate Gulf's service, which will help you select the right lubricants and fuels for every unit of equipment you operate.

Consult the telephone directory for the number of your nearest Gulf office and let us discuss how Gulf products and fine service can benefit your operation.

GULF

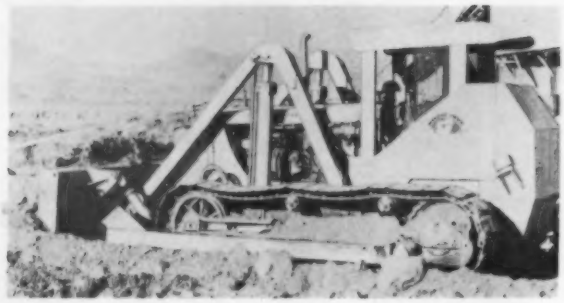
GULF OIL CORPORATION • GULF REFINING COMPANY
1822 Gulf Building, Pittsburgh 30, Pa.

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS



● A diesel crankshaft refinishing machine tool is offered by Aero-Motive Mfg. Co. for refinishing crankpins within the engine without removing the crankshaft. It runs on two split adapters that belt on to crank-cheeks and accuracies of less than .001-in. in roundness and finishes of 32 micro in. are obtained. It is available in five sizes for crank pin diameters of 4 to 20 in., the unit being designated Model C. Because the machine is readily portable, work can be done "on location" in the engine, thereby considerably reducing downtime. ← (62)

● Known as the Lima Type 24 Jobmaster, a new ½-cu. yd. power shovel, of 13- to 15-ton capacity crane is announced by Baldwin-Lima Hamilton Corporation. The smallest unit in their line, it is available with crawler or rubber mountings and is readily convertible to many applications. Maximum overall length is 10 ft. 2 in. with overall width of 8 ft. with 16-in. treads. As a shovel it is equipped with a 16-ft., 6-in. boom and 13-ft. dipper handle. This air-controlled shovel employs machine cut gears, large diameter brakes and clutches in the hoist, and tractor-type steering. ↓ (63)



● A new bulldozer attachment, suitable for mounting on Austin Overshot Loaders, is announced by Austin Div., Central Steel Products Co. It is easily installed in 15 minutes by removing and replacing 4 mounting pins, has a 15 deg. blade tilt adjustment and 45 deg. on front-dump bucket equipped machines. ↑ (64)

NEW LIGHT-WEIGHT HIGH-SPEED CORE DRILLING MACHINES

SKID MOUNTED

For jobs not easily accessible by truck or trailer.

Wide structural steel base and low center of gravity assure maximum stability. Powered by either gasoline or Diesel engines; air or liquid cooled.

Easy to Use Easy to Move

Modern simplified design includes machine-cut alloy-steel gears, anti-friction bearings and other improved features to assure low-cost trouble-free operation. Backed by more than seventy years of world-wide experience in all types of diamond drilling.

Complete information furnished promptly on request. Get our prices, also, on Oriented Diamond Bits and all other accessory equipment for Diamond Core Drilling and Soil Sampling.

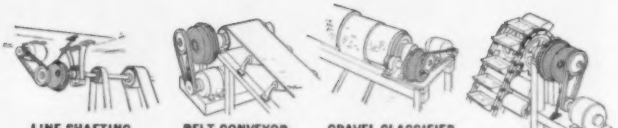
TRAILER MOUNTED

For easy portability without tying up a truck. Also complete truck-mounted units with 4-wheel drive.

SPRAGUE & HENWOOD, INC.
SCRANTON 2, PENNA.
NEW YORK • PHILADELPHIA • PITTSBURGH
GRAND JUNCTION, COLO. • BUCHANS, NFLD.

● All Torit Mfg. Co. dust collectors of both cabinet and cyclone type are now available with casters as optional equipment. This will permit the collectors to be moved more easily, quickly and quietly. The casters are of hard rubber, 3 in. in diameter and 1 in. wide for smooth rolling. Two in each set are provided with locks, and all are welded to the bottom of each unit at the factory. The Model 66 shown, of cabinet-type collector, is one of the 17 models affected by this adaptation, ranging from the 160-lb. Model 54 to the 1,130-lb. Model 122. These units are a compact, and efficient, means of having readily portable dust collection available for any part of your plant with low cost and ease of operation. ↑ (65)

Falk ALL-STEEL Shaft Mounted Drives



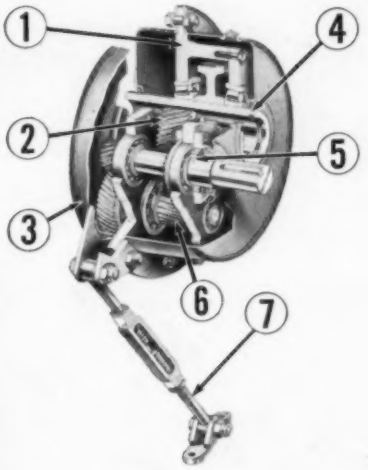
LINE SHAFTING | BELT CONVEYOR | GRAVEL CLASSIFIER | BUCKET ELEVATOR

APPLICATIONS UNLIMITED

The range of applications to which the all-steel Falk Shaft Mounted Drive is ideally suited is so wide that complete listing is impracticable. The sketches above are included only to indicate a few typical installations where considerable speed reduction in limited space is an important advantage.

SIX SIZES

- 1/2 to 30 hp
- Single or double reduction
- Wide output speed range—420 to 10 rpm



These versatile, NEW speed-reducing units

save space, power, material and time

Here is the economical solution to the countless application problems requiring efficient speed reduction in limited space! The new Falk all-steel Shaft Mounted Drive—a modification of the universally-accepted Falk Motoreducer design—embodies many exclusive structural and functional features which add up to better service, longer life and substantial savings.

This rugged, compact drive mounts directly on the driven shaft—a distinct saving in floor space. Its precision Falk helical gearing gives highest mechanical efficiency, with a resultant power saving. No adjustable motor bases or slide rails are required. Installation is simple and rapid—output speeds can be quickly changed; thus time is saved...Write to Department 247 for engineering bulletin, including selection and dimension details.

FALK "In-Built" Factors... that give maximum efficiency, convenience and dependability

1 **All-steel Frame,** with more than double the rigidity of iron, supports all rotating elements.

2 **Precision Helical Gears,** designed and machined by Falk, rated to AGMA standards.

3 **Pressed Steel Housings,** whose sole function is to keep oil in, dirt out; easily removed for gear inspection without dismounting unit.

4 **Through Hollow Shaft** with counter bore provides for easiest installation or removal from driven machine shaft extensions.

5 **Backstop** can be furnished with the unit or added later for positive prevention of reverse rotation.

6 **Positive Lubrication,** continuous direct dip of revolving elements at all speeds.

7 **Tie Rod** and turnbuckle serve as anchor and facilitate V-belt or chain adjustment.

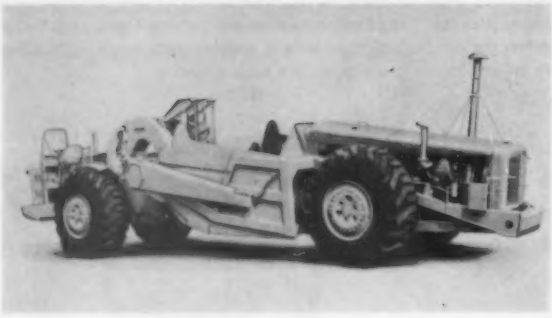
THE FALK CORPORATION, Milwaukee 8, Wisconsin

MANUFACTURERS OF

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

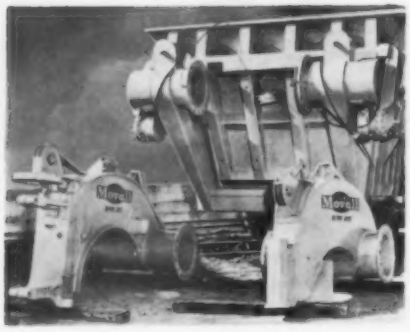
FALK

...a good name in industry



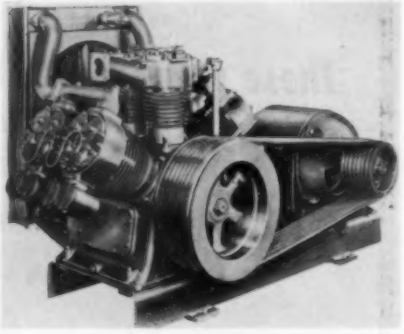
● Two new 18-yd. Euclid scrapers are the Model S-18, powered by a 300-hp. engine, and the Twin-Power Model TS-18 having two 194-hp. engines, one driving the tractor wheels and the other providing power to the rear wheels. Each utilizes Allison Torqmatic drive, consisting of torque converters and semi-automatic transmission, which eliminates clutching and permits the operator to change from one speed range to another under full power. All operations on both models are controlled by hydraulic lever action. ← (66)

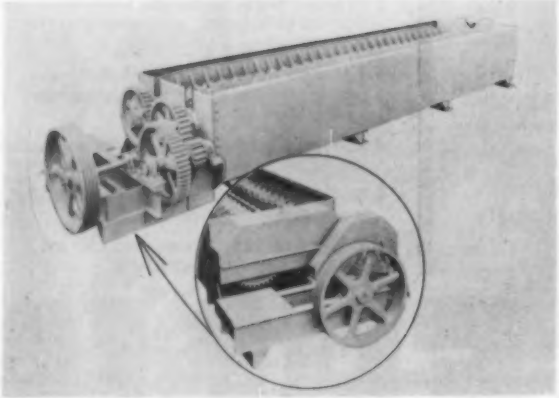
● Galion Allsteel Body Co. offers a new tandem axle trailer dump, for use with tandem rear axle tractors, and designated Model TTM Transporter. It is available in body lengths of 19 to 24 ft. with payload capacities from 10 to 36 cu. yd., and is equipped with optional twin telescopic hoists, with lifting capacities of 35 tons. A full selection of axle capacities, brake types, tire sizes are made available. A full selection of axle capacities, brake types, and tire sizes is available. ↑ (67)



● Quick interchangeability in yoke sections to fit Caterpillar DW20 or DW21 and similar prime movers is offered by the C & D Mfg. Co. in their Movall power ejection and dump wagons. ← (68)

● A new line of 2-stage, air-cooled, electric motor-driven compressors is announced by the Le Roi Div. of Westinghouse Air Brake Co., having 50-, 75- and 100-hp. motors. Shown is the 3-cylinder Model 50S2. → (69)





● Shown above is the McLanahan "Mudmaster" log washer for cleaning aggregates and other materials, newly designed by McLanahan & Stone Corp. It is furnished with 10-in. sq. box section logs, available in 25- and 30-ft. lengths, requiring 50 and 60 hp. drives. ↑ (70)

● The R-120 (4x4) new 4-wheel-drive International truck pictured above has a G.V.W. rating of 7,000 lb. and is offered in four wheelbases between 115 and 134 in. It is powered by the high torque No. 220 engine of 108 hp. or the 240 engine of 131 hp. Minimum body and step height are design features. ↑ (71)

an ACCO product

American Cable TRU-LAY VHS 15% STRONGER

NOW At Your Distributor
The New Wire Rope That's Breaking All Records

For Shovel Hoist Ropes, Scraper Ropes and Draglines

Your American Cable Distributor now has Draglines, Shovel Hoist Ropes and Scraper Ropes made of New TRU-LAY VHS. This new wire rope was specially developed for these toughest applications in the construction field. It is 15% stronger than Improved Plow Steel, which was the strongest grade available until now.

Heavier Loads—Higher Safety Factor

With New TRU-LAY VHS you will be able to handle heavier loads with the same diameter line. And its greater strength means a higher factor of safety during its entire service life.

Tougher . . . For Longer Life

In addition to its greater strength, new TRU-LAY VHS is also tougher . . . more wear resistant. And it has all of the advantages of preformed construction. This means longer life under the rough treatment that Scraper Ropes, Shovel Hoist Ropes and Drag Lines necessarily get.

Less "Down Time"—Cuts Costs

Because it is tougher and more wear resistant, TRU-LAY VHS rope lasts longer, costs less to use and cuts "down time" of equipment for wire rope replacement.

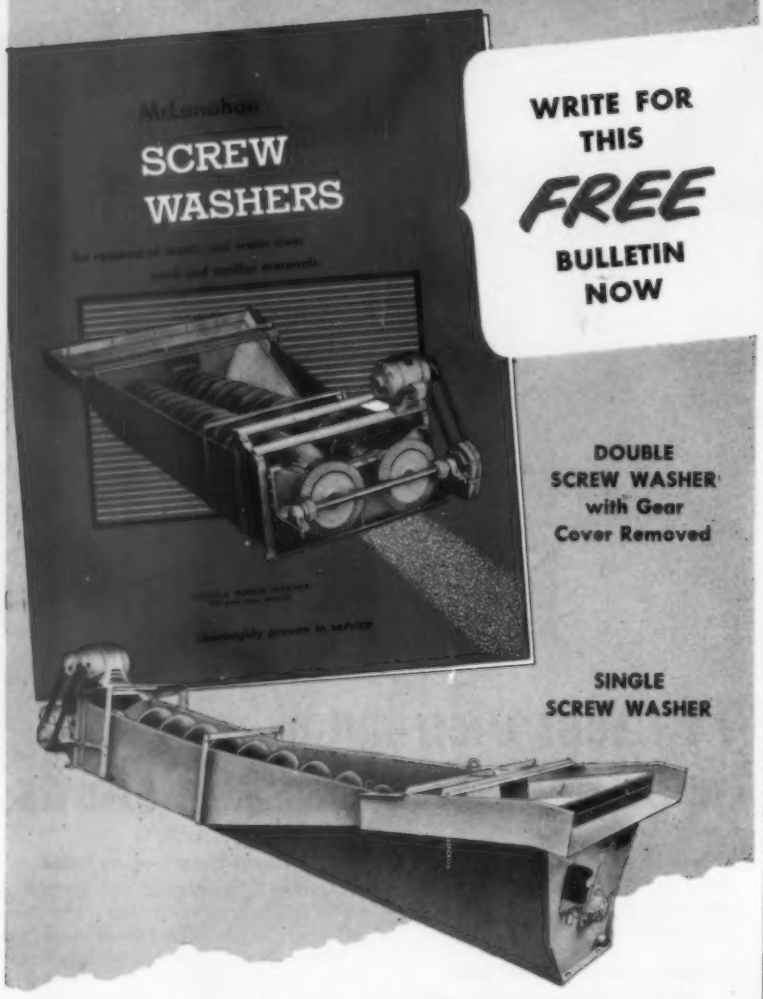
TRU-LAY VHS ropes are easy to order. Just ask for TRU-LAY VHS Shovel Hoist Ropes, Scraper Ropes or Draglines, in the size you want. You don't need any complicated specifications.

Your American Cable Distributor has TRU-LAY VHS *in stock now. See him or write to the nearest American Chain & Cable Company office.*

ACCO American Cable Division
AMERICAN CHAIN & CABLE

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.

How to Dewater, Classify and Remove Waste from Sand, Limestone and Similar Materials*

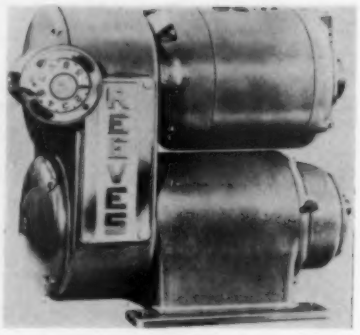


* Here's a new bulletin you should have—on cleaning, dewatering, classifying sand and other coarse or fine materials—with McLanahan Single or Double Screw Washers. Complete details on models, capacities, screw sizes, etc., available. Write for your copy today!

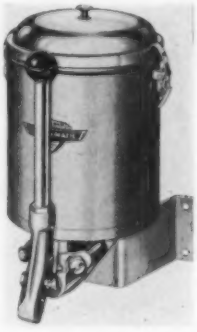
McLANAHAN & STONE CORPORATION

PIT, MINE AND QUARRY EQUIPMENT HEADQUARTERS SINCE 1835

333 Wall Street, Hollidaysburg, Pennsylvania



● Reeves Pulley Co. offers a newly designed No. 100 series Vari-Speed Motodrive for 1-hp. applications. The streamlined, compact design results in a 20 percent saving in space over previous designs. This unit occupies less than 17- by 22- by 12-in. space in vertical models, and combines a "weatherized" motor, speed-changing mechanism, and gear reducer into one compact package. It is available in speed ranges from 2:1 through 8:1 and can be had in any one of 112 different assemblies to meet exact space requirements. ▲ (72)



● A simple, positive, high-pressure centralized system for controlled lubrication of bearings while machines are operating has been recently announced by the Lincoln Engineering Co. The pumping unit is manually-operated and has a 15-lb. capacity reservoir for grease or oil, which is forced under 2,500 p.s.i. into each bearing. ▲ (73)

● New improved Colmonoy hard-facing alloy powders and Spraywelder pistol used to apply powders as protective hard-facing surface is offered by the Wall Colmonoy Corp. in units of 5 lb. containers. Improved manufacturing techniques have resulted in powders of 10 percent improvement in deposit efficiency. ▲ (74)

P & Q *product briefs*

(use reply card for more information)

VIBRATING SCREEN made by the Diester Concentrating Company, is a new Model E single surface, open type, motor driven, Leahy heavy duty vibrating type with the latest FlexElex electric heating jacket equipment. This information is contained in the new Leahy screen bulletin No. 16-EH of the Diester Co. **Circle No. 75**

●

HYDRAULIC CYLINDERS which lift, turn, lower, eject, reciprocate, swing, turn, clamp, hold and squaeeze are described with full detail ini a folder recently issued by the Benton Harbor Engineering Works. Custom built to serve any industry, BHEW cylinders feature accurately honed barrels, hard-Chrome-plated rods, small O.D. and any mounting required to suit any job. They have high and low pressure cylinders available in all sizes and types: cup-type, ring-type or O-ring construction. **Circle No. 76**

●

FILTERS, disk, drum and laboratory types, are described in a 16-page bulletin distributed by the Denver Equipment Co., with complete data and many illustrations, drawings and specifications included. These filters are designed to produce a drier filter cake through patented features, lower maintenance cost, reduce shutdown time, increase filtering area and to handle more than one product at a time. The testing division of the company will conduct filtering tests without cost or obligation to determine the filtering characteristics of any material. **Circle No. 77**

●

CUSTOM FABRICATORS of bins, chutes, hoppers, etc., in any metals such as carbon steel, stainless, clad metals, aluminum, monel or nickle, the Capital City Iron Works seeks contracts for such fabrication. Equipped with over 40,000 sq. ft. of plant and the finest of general and special machine tools, this company has been in business since 1913. They are also erectors offering a complete service without division of responsibility, and will take a job from layout to finished item. **Circle No. 78**

●

HYDRAULIC HOSE and couplings for medium-high and high pressure service, is offered by the Joy Mfg. Co. The couplings feature a "double-wedge" grip which, it is claimed, makes possible assembly on rubber covered hose without skiving. Through use of a special slotted bushing, retightening the Surgepruf coupling on the hose without disassembly is possible, when and if this comes loose through vibration on flexing. **Circle No. 79**

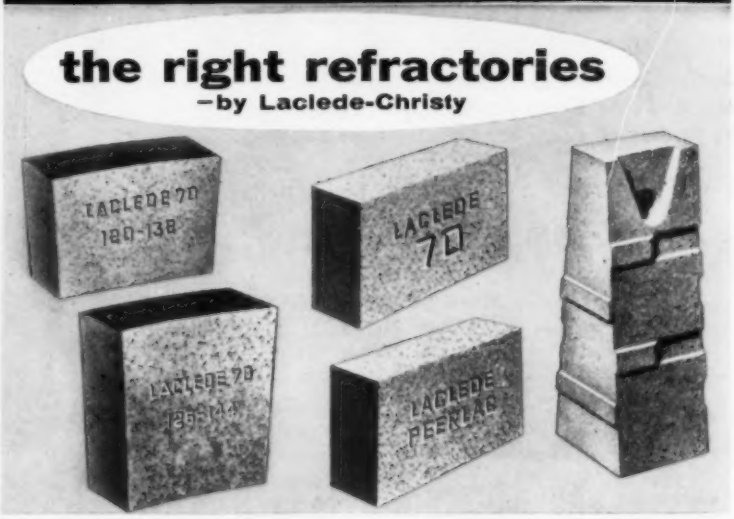
●

REFRACTORY CASTABLES, recommended for application in the cold zone of rotary cement kilns, is now being offered by J. H. France Refractories Co. as Hydrecon 186, extra strength. Intended for us where higher compressive strength is required than that afforded by regular 2450F castables, it develops almost twice the cold strength of such at room temperatures, and more at 2,000 deg. F. **Circle No. 80**

●

TOUGH RUBBER HOSE, fortified with a "stomach" of the toughest abrasion-resisting rubber known, swallows 10-lb. chunks of mineral materials without wincing, according to B. F. Goodrich Co. Such a hose should find many applications in the pit and quarry industries. The durable inside is a special rubber compound called Armorite, which is said to outwear steel 20-to-1 in many applications. **Circle No. 81**

For economical, long-lasting, ring-resisting kiln liners, rely on Laclede-Christy 70% alumina refractories. They offer advantages of unusually low porosity, high strength, high density, resistance to fluxing action of clinkers, and possess high refractory value.



the right time to use Laclede-Christy high alumina refractories is now

Your use of Laclede-Christy refractories is your assurance of steady, economical production. You get "quality-first" product performance, verified by many, many service records. You get refractories to meet your exact requirements. You get quick, efficient service from nearby Laclede-Christy plants or distributors' warehouses. Call now.

LACLEDE-CHRISTY COMPANY

HKP

DIVISION OF H. K. PORTER COMPANY, INC.

2000 Hampton Avenue • St. Louis 10, Missouri
Mission 7-2400

LACLEDE-CHRISTY COMPANY Quality First

Check

PRICE PER POUND OF LIFT CAPACITY

Here is a sound way to measure the value of excavators and cranes. Compare machines on the basis of price per pound of lifting capacity. You'll very quickly learn which machine offers you the biggest production capacity per dollar of equipment investment.

Remember — lift capacity is *work capacity*. Obviously, the machine with heaviest lift rating not only picks up larger crane loads. It also has more strength, speed and stability with every excavator attachment to handle bigger loads on a faster operating cycle.

Check the Koehring lift ratings shown below — then ask your Koehring distributor to give you the figures on price per pound of lift capacity.

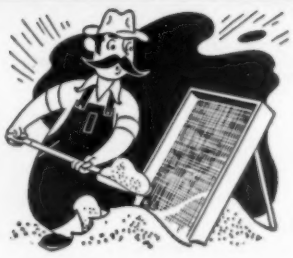
compare for yourself:

KOEHRING MODEL	SIZE DIPPER	KOEHRING LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load)		PRICE PER POUND OF LIFT CAP.*
205 CRAWLER	½-Yd.	20,000 lbs.	30-foot boom at 10-ft. radius	?
205 ON RUBBER	½-Yd.	30,000 lbs.	25-foot boom at 12-ft. radius	?
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	?
304 ON RUBBER	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-ft. radius	?
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-ft. radius	?

Figures available on request—ask your Koehring distributor to see them.

KOEHRING COMPANY Milwaukee 16, Wis.
Subsidiaries: JOHNSON
PARSONS • KWIK-MIX

Screenings



by Ray L. Smith, Jr.

FEAR of humiliation is one of the levers which credit men sometimes use, although we do not like it. Have you heard about the following letter which went to a slow-paying customer? "What would your neighbors think if our truck stopped in front of your home, and we took away all this furniture?"

Back came this unexpected reply: "I have discussed your question with all of my neighbors, and they think it would be a lousy trick."

Aside from the funny side, there may be a lesson in that exchange of correspondence. Few people can be *frightened* into paying their bills. The average American is a fair-minded fellow, and means to do right. He is far more responsive to sympathetic understanding of his problems, and a willingness to help solve them, than to threats.

This'll Give You A Charge

RECENTLY a Quartzite Rock company moved its operations about two miles from its old site and had to have high voltage lines strung to supply power for the 100-hp. motors which it uses.

The city which supplied the electricity was not in a position to string the lines so the company had the work done.

When it came time to start up the motors there wasn't enough juice to power them so electrical engineers were called in to solve the problem.

In time capacitators were cut in on the wires and everything was harmonious until the end of the month and billing time was at hand.

The company, which had been paying about $1200 a month for electricity, received a bill for only $300.

A check of the lines revealed that when the motors were turned off, the excess power generated by the capacitators ran back into the meter and forced it to run backwards, thus cancelling off most of the power which had been metered.

Remember, as kids, we rented a car for that very special date and we'd sit up half the night with the rear wheels jacked up, running the odometer back to within a few miles of where it was when we got the car?

Pretty Weighty

WHILE admittedly not 100% technical, the accompanying photo does contain qualities of universal appeal.

The photographer who took the picture seems to have had something else on his mind, though he did manage to call attention to the

fact that vivacious Miss Venus of 1955 is checking her 113 pounds of pulchritude on a Dillon Weight Indicator.

Some practical soul will inevitably point out that the photo is clearly intended to show the scale, and that Miss Venus is simply a means to that end. Okay, so the scale is easy to read and comes complete with eyebolt and 360° swivel hook, we'd much rather forget the scale and have Venus help us prove Albert Einstein's description of RELATIVITY.

Einstein once said: "When a man sits in a hammock with a pretty girl for an hour, it seems like a minute. But let him sit on a hot stove for a minute—and it's longer than any hour. That's RELATIVITY."

Potpourri and Succotash

The salesman's knock was answered by something beautiful.

"Oh, good morning, madam. May I speak to your husband?"

"Sorry, he's away on business and won't be back for a week."

He took another long look, sighed, and asked, "May I come in and wait?"

Two little boys, out fishing, passed a nudist camp with a high, board fence around it. One kid, spying a knot hole, went over and looked through.

"What's in there?" asked the other kid.

"It's full of people," was the answer.

"Men or women?" asked his companion.

"I can't tell," said the peeper. "They ain't wearing any clothes."

A prospective proofreader was asked how to punctuate: "Mary went in swimming and lost her bathing suit."

"I'd make a dash after Mary," said he.

A prominent businessman fell in love with an actress and decided to marry her, but for the sake of prudence he employed a detective agency to prepare a report on her life.

The operatives' report read: "The lady has an excellent reputation, her past is without blemish, and she has a circle of impeccable friends. The only breath of scandal is that lately she has been seeing a great deal of a businessman of doubtful reputation."

How many hundred dollars will this ad save you?

Both K-2 and K-4 links are shown at the left. When wide buckets are used, Kensington's special 4-hole K-4 makes it possible to use one strand instead of two ... *and that single KENKROME chain will be stronger than two ordinary No. 844 chains!*

How much do you spend each year to replace elevator chains and sprockets?

Be sure to include the labor needed to make each change. And don't forget loss in production while your plant is shut down for repairs.

Now figure the money you'd save by using a chain that outlasts ordinary chains 2 to 4 times. That's what you can expect from the improved KENKROME No. 844 Heavy Duty Elevator Chain shown above!

KENKROME is no ordinary steel ... in fact it's no ordinary manganese steel. There's no other steel quite like it.

Addition of special alloying metals under a patented process, plus Kensington's own scientific method of heat treatment, have created this remarkable metal which defies wear by developing surface hardness under impact to better enable it to withstand abrasion. Beneath this continually hardening surface, the metal always remains tough ... better able to withstand shock than are metals that are hard all the way through.

But Kensington's wear-conquering engineers didn't stop with development of the metal itself. They redesigned the physical characteristics of the links. Note, for example, how the extra-heavy 1¼" pin is held in place. Even in those rare instances when a pin *does* break, it can't fall out, for on one end a cotter pin fits over its head, and on the other, a cotter pin passes through both pin and extended boss. Pins have T-head so they may be reversed. They fit link holes that are drifted to close tolerances. Links are extra heavy ... heavier than in any other No. 844 built.

The Renewable Tooth Sprocket is another example of Kensington's improved design. Tooth segments can be replaced by two men during lunch hour ... without even removing the chain! And a new set of teeth costs but a fraction of what you'd pay for a complete one-piece sprocket.

KENKROME Chains and Sprockets are built to fit all standard conveyors and elevators used in rock, gravel, and cement plants. It will pay YOU to *Switch to KENKROME!*

To find what it will cost, just fill in and mail the coupon. You'll be under no obligation.

Other wear-resisting alloyed ORO manganese replacement parts

Elevator buckets that last longer, seldom need replacing.

Crawler treads for all sizes and types of shovels and draglines.

Replacement parts for roll and jaw crushers, ball, rod, tube, hammer mills.

Crawler sprockets for most shovels and draglines.

Kensington STEEL COMPANY

KENSINGTON STEEL CO., Dept. P, 505 Kensington Ave., Chicago 28, Ill.

SUBSIDIARY OF POOR & COMPANY • CHICAGO

☐ Please quote prices ☐ Please ask salesman to call

Chain Information
CHAIN NO. _____ TYPE _____ LENGTH _____
ATTACHMENT NO. (OR 2 BOLT PINS) _____ SPACED EVERY _____ PITCH

Sprocket Information
CHAIN NO. _____ NO. TEETH _____ SHAFT DIA. _____
HUB LENGTH _____ CENTRAL ☐ OFFSET ☐ KEYWAY _____ BUSHED _____

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Withstands far greater

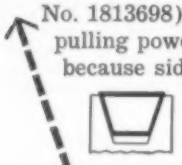
SHOCK LOADS

than any standard V-belt

Here are the interesting reasons why Gates Super Vulco Ropes stand up months, even years longer than *any* standard V-belts...

1. *Super-Strength Cords* provide 40% greater horsepower capacity . . . easily absorb heavy shock loads. **2.** *Flex-Weave Cover* (U.S. Pat. No. 2519590) provides greater flexibility with far less stress on the fabric. Cover wears longer — increases belt life, lowers belt costs.

3. *Concave Sidewalls* (U.S. Pat. No. 1813698) provides sure pulling power, longer wear because sides straighten out as belt bends— make even contact with sheave walls.



Straight-sided belts bulge out when bent around sheave. Uneven contact causes uneven wear.

SHOCK LOAD of this big jaw crusher at Canadian Quarries, Ltd. is absorbed by Gates Super Vulco Rope Drive. Wherever shock load is severe, Gates Super Vulco Ropes cushion the shock—keep machinery replacement cost down.

4 other outstanding advantages

Resists Oil, Heat and Weather: Long life is assured even in the presence of excessive oil . . . even under prolonged exposure to heat and weather.

Provides Static Safety: The high electrical conductivity of Gates Super Vulco Ropes provide safer drives in explosive atmosphere.

Has Little Stretch When Wet: Low moisture absorption eliminates need for special take-up in wet locations.

Saves Space: Higher horsepower rating and greater resiliency may permit fewer belts, or smaller sheaves where space saving is vitally important.

Gates SUPER Vulco Rope

The V-Belt with 40% more horsepower capacity

TPA 57

CATERPILLAR ANNOUNCES

2 NEW TRAXCAVATORS

CATERPILLAR LEADERSHIP
IN ACTION

With

NEW No. 955

1½-yd. capacity

Balanced units for bigger profits!

NE

No.

1-yd. c

"Big production" features of the new CAT No. 955 and No. 933 Traxcavators

40-DEGREE BUCKET TIP-BACK AT GROUND LEVEL. Tip-back action at low bucket height results in maximum possible loads every pass in any material—bigger production per day!

NEW OIL-TYPE CLUTCH. Stands up under continuous repeated use. Cuts maintenance costs and time two ways. (1) Clutch adjustment, while easy, is seldom required. (2) Plate replacement is often unnecessary even at engine overhaul.

Also helps step up production by providing easier shifting for operator!

MODERN HYDRAULIC SYSTEM. Hydraulically balanced vane-type pump insures delivery of full volume and pressure of oil for thousands of hours. Control valves located in tank receive maximum protection against damage and dirt. Closed hydraulic system—no vents or breathers—prevents entrance of dirt. Full-flow hydraulic system filter protects moving parts against abrasive particles in fluid. Filter handily located for easy replacement of element!

PLENTY OF POWER. Power is ample to "bury" the bucket and provide fast lifting action and positive dumping under all load conditions.

"DESIGNED-IN" COMFORT. Operator sits high, with excellent visibility of all bucket positions. All controls easy and convenient to operate—bucket control a one-hand operation! Pilot-house visibility—leisure-chair comfort.

PERFECT BALANCE. Weight distribution, engine horsepower and bucket capacity are balanced so that the full length of the track stays on the ground with a heaped load in the bucket.

NEW 3-GROUSER TRACK SHOES. Tested and proved on tough jobs, they deliver better traction—longer life!

OPTIONAL STARTING. Your choice of 6-volt electric starting for starting engine or 24-volt direct electric starting—from the seat, either way.

VERSATILE ATTACHMENTS. Your job range is increased by a variety of buckets and other useful attachments.

EW

933

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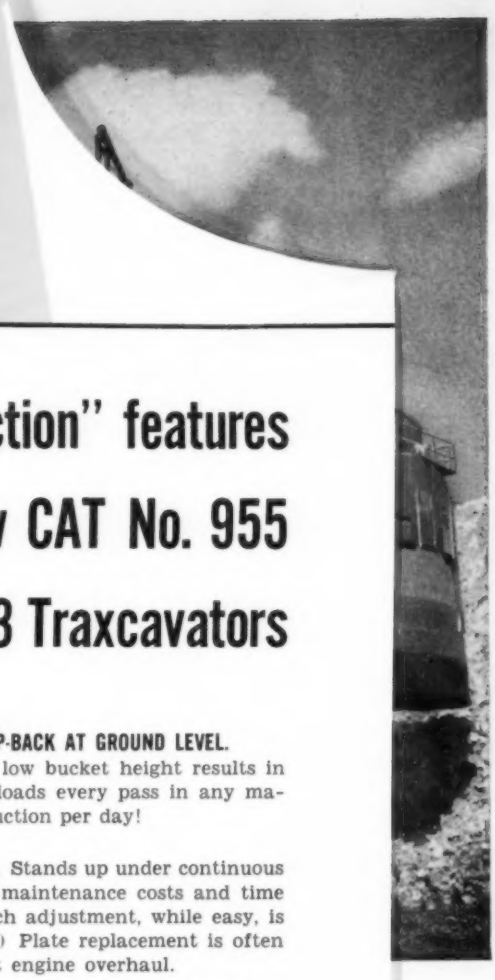

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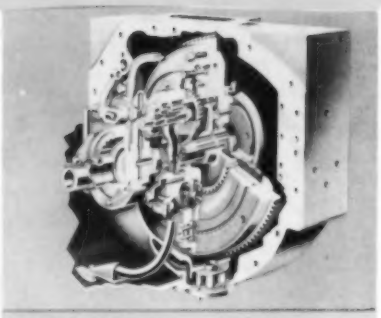
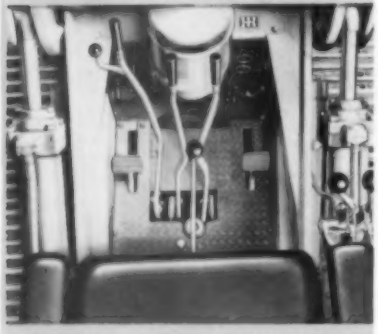
40-DEGREE BUCKET TIP-BACK AT GROUND LEVEL assures large loads every pass!



NEW OIL-TYPE CLUTCH sets new records for long life and minimum maintenance!

HIGH REACH with box-section lift arms for rugged service. Cross brace prevents twisting!



CONVENIENTLY LOCATED LIFT AND DUMP LEVERS provide one-hand operation!

HYDRAULIC FILTER IN HANDY LOCATION affords easy replacement of the element!

BRIEF SPECIFICATIONS

	No. 955	No. 933
Flywheel HP at sea level	70	50
Bucket capacity, cu. yd.	1½	1
Bucket tip-back at ground level, degrees	40	40
Bucket tip-back at max. lift, degrees	47½	48
Dumping height (center of hinge pin to ground)	128"	118½"
Weight (approx.) lb.	21,480	15,500

—AND MANY OTHER FEATURES!

Balanced for more work at less cost...

The new Caterpillar No. 955 and No. 933 Traxcavators

Designed from the ground up as excavating and loading machines, the new CAT* No. 955 and No. 933 Traxcavators are balanced *units*. Built and backed from tracks to buckets by *one* manufacturer, they also give you advantage of *one* service source—your nearby Caterpillar Dealer. With practical, advance-design features, they're engineered to *outproduce* ordinary tractor-shovels of equivalent size. You'll find these versatile units the handiest tools in your equipment line-up. Get the money-making picture from your Caterpillar Dealer—ask for a demonstration!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NEW BIG-PRODUCTION TRAXCAVATORS

MAIL TODAY!
CATERPILLAR TRACTOR CO., Peoria, Illinois, U.S.A.

I'd like more information on the new No. 933 and No. 955 Traxcavators.

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Company_____

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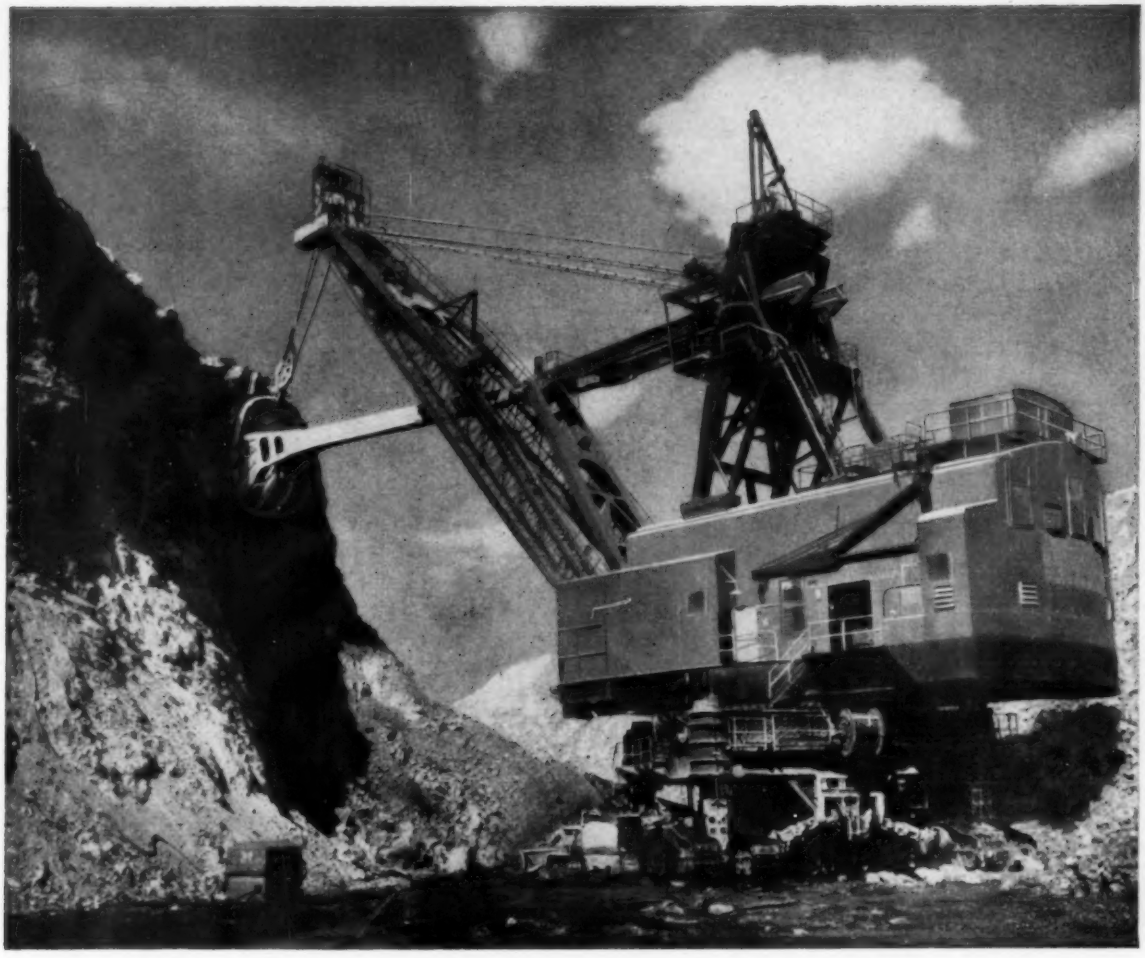


COULD FILL 48,000 RAILROAD CARS PER MONTH! Owned by a major coal company, this electric shovel weighs approximately 3,500,000 pounds and has a dipper capacity of about 50 cubic yards. Nevertheless, the mammoth machine is capable of climbing grades steeper than 20%! To help it achieve maximum performance in this grueling work, its owners, after testing nearly every major brand of gear lubricants, chose Cities Service L Compounds for the job. The results have justified this choice.

BIG job . . . BIG machine . . . BIG lubricants!

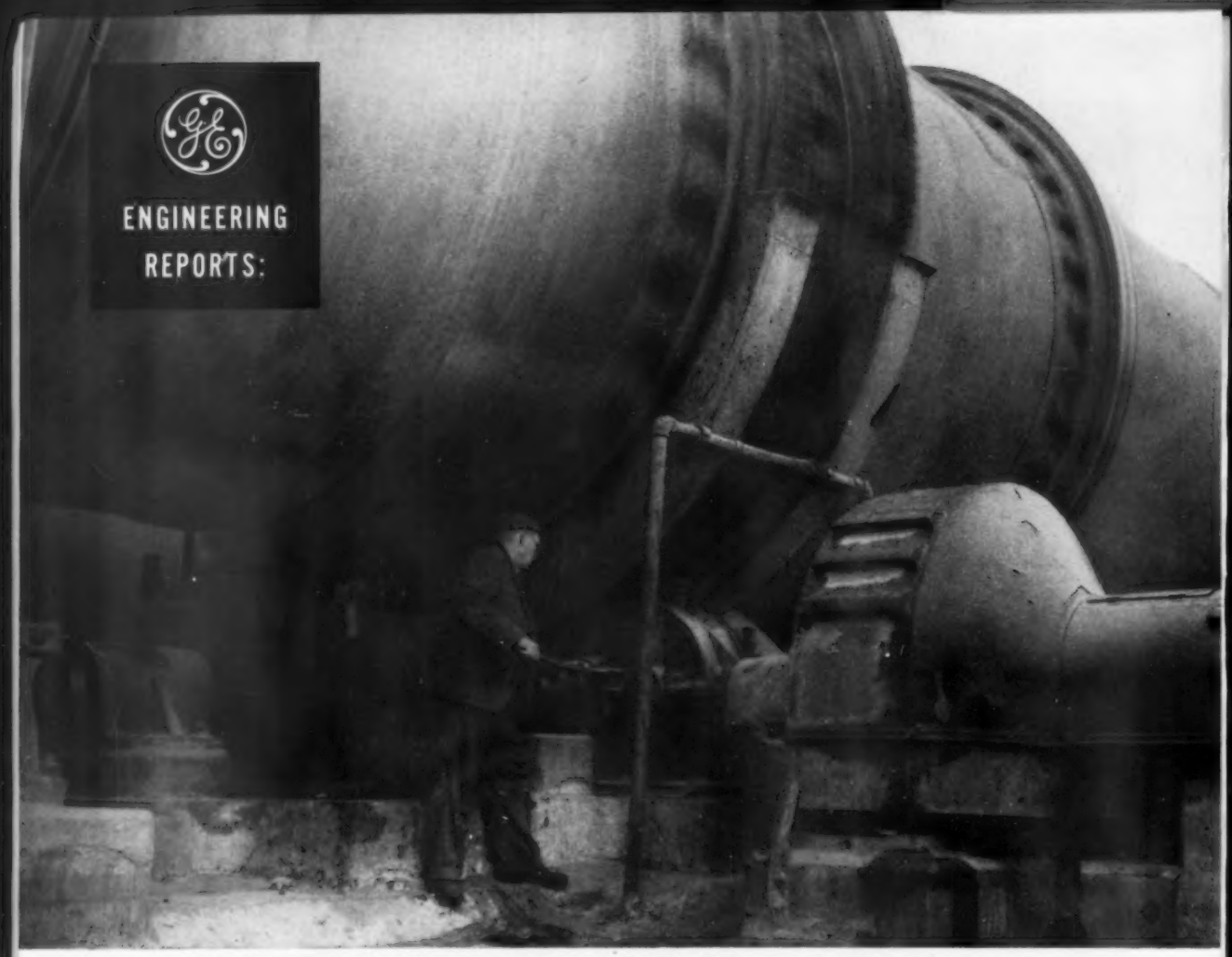
Gear Oils Of Almost All Major Refiners Were Tested In This Giant Shovel. Cities Service Got The Job.

This giant 50-yard shovel is one of several currently in use by a major coal company. This same company also employs in its strip-mining operation, an extensive fleet of haulage trucks, bulldozers, earthmovers, coal preparation plant equipment, and miscellaneous vehicles.

Not long ago, it was decided to attempt to simplify and standardize the gear oil requirements of this equipment. Following this plan, the company first tested the gear oils of nearly every major refiner. The result: Cities Service L Compounds were chosen to do the job!

Again and again, where there's a big job to be done, mining men turn to Cities Service . . . because they've found Cities Service lubricants do the job better, do it easier. And the same is true of Cities Service Lubrication Engineers. If you have a lubrication problem . . . or if you'd simply like to check the efficiency of your present lubrication procedures, why not call in an expert Cities Service Lubrication Engineer. Simply contact your nearest Cities Service office or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS



ACCURATE BURNING CONTROL IS AIDED BY G-E ADJUSTABLE-SPEED MOTORS (weather-covered by customer)

General Electric systems and engineering services help

Cut costs of plant expansion as cement

The cement industry is growing fast. Nationwide highway programs and growing uses of cement in the building industry are greatly accelerating the demand. Industry forecast: 25 to 30% expansion in the next five years!

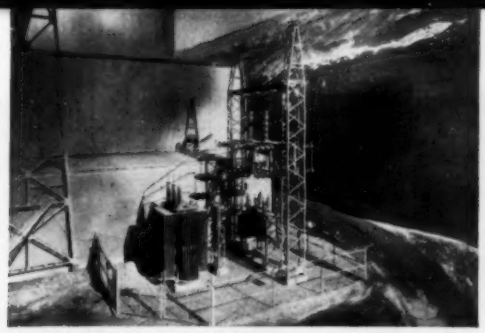
In your plans for expanding or modernizing existing facilities or building a new plant to meet growing cement demands, General Electric systems and engineering services can help save you time and money. G-E systems are engineered to require minimum operating personnel and maintenance. More important, versatile G-E equipment is easily incorporated into your existing system. And flexible G-E system design simplifies the addition of new equipment later.

Working with you and your consultants, G-E engineers provide many kinds of experienced help. Equipment selection and delivery can be co-ordinated by G.E. on a system basis, saving you valuable engineering man-hours and eliminating time-consuming paper work. You get production rolling sooner, too, because experienced G-E field engineers help speed installation to meet or better start-up dates. (If necessary, G.E. can even develop new electrical solutions to your special problems, utilizing extensive research and developmental facilities.)

Put these G-E systems and services to work early in your modernization or expansion planning. For more information, contact your local G-E Apparatus Sales representative or write for bulletin GEA-5984 to General Electric, Section 658-15 Schenectady, N. Y.

Engineered Electrical Systems for the Rock Products Industry

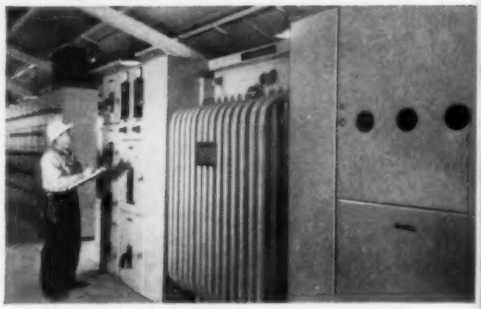
GENERAL ELECTRIC



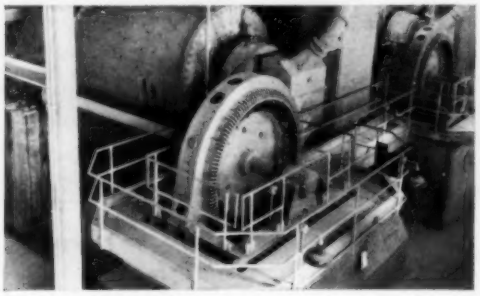
FLEXIBILITY and adequate power supply are achieved with G.E.'s easy-to-expand outdoor substations.

SKILLED APPLICATION ENGINEERS help plan and integrate your system.

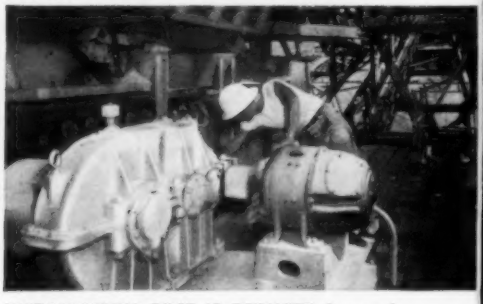
CENTRALIZED CONTROL is provided by low-voltage G-E Cabinetrol*, factory-wired and easy to install.



COMPACT G-E load center unit substations supply power close to load, minimize losses.



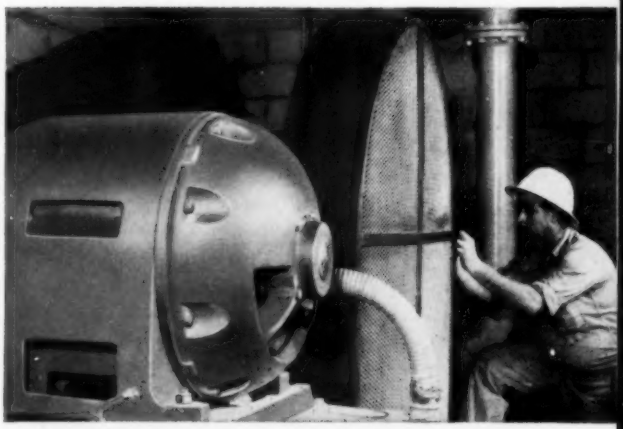
TOUGH AND STURDY G-E high-voltage synchronous motors for grinding have torque tailored to match load requirements with power supply system.



INSTALLATION COST IS REDUCED by packaged G-E Speed Variators, custom-engineered for adjustable-speed applications.

industry prepares to meet growing demands

ECONOMICAL, FAST HAULAGE of heavy loads is possible with powerful G-E diesel-electric locomotives. They require little maintenance, move more tons per hour at lower cost per ton.



DEPENDABILITY is a recognized advantage of G-E Tri-Clad* motors. This induction motor, driving an air compressor for agitation in slurry basins, requires minimum maintenance.

*Reg. trade mark General Electric Co.

An aerial view in which the 35-ft. bench intervals of the pit can be seen in the foreground. The haulage road to the plant appears on the right, and the huge tailings pile shows up behind the plant, office, and service buildings.

Johns-Manville's Munro Mine First Asbestos Development In Ontario's "Golden Area"

Mill Speedily Erected Despite Severe Weather

THE Munro mine, which is owned and operated by the Canadian Johns-Manville Co., Ltd., and located in Munro Twp., 11 miles east of Matheson, Ontario, is not only Ontario's only asbestos mine, but represents the first commercial development of that mineral in the province. Asbestos outcrops in this "golden area" of northern Ontario had been all but forgotten during the many years in which the region had been the scene of intensive gold prospecting, and it therefore remained for Johns-Manville to establish the true value of this natural resource and establish a plant for its production.

Based on prospecting by company personnel, negotiations were opened late in 1948 to acquire options on claims in the Matheson area. The first diamond drill hole was collared on March 29, 1949, and three months later the decision was made to mine the orebody. It was established that a belt of fibrous serpentine, or chrysotile, starts with the Munro "A" orebody and strikes north and west for many miles. Parts of this serpentine belt are fiberized to varying degrees—generally being associated with intensity of faulting. Because of the association of magnetite with the fiber, and the faulting, magnetometers and dip

needles were employed to give ore indications which were then checked by diamond drilling. The cores recovered were milled and analyzed for fiber content. Using these methods of evaluation, exploration engineers completed tests on the deposits in June, 1949, and Johns-Manville acquired five orebodies on this mineral belt.

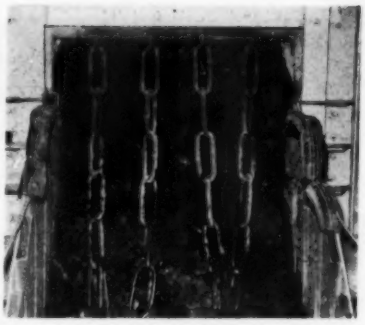
While opening the mine involved substantial effort, the speedy construction of the mill buildings was an even more striking accomplishment. Despite temperatures ranging from 95 degrees above to 56 degrees below zero, ground frozen to a 7-ft. depth, and about 100 in. of snow, the general contract which was signed in July, 1949, was completed in just 190 working days. Before plant construction could start, a road 1½ miles long connecting the site with the main road to Matheson had to be built. The mill and crusher buildings, which constituted the largest construction items, were started in August, and by the following March the buildings were complete and the equipment in place.

The mill is a five-story steel bay building with roughly a 66- by 272-ft. basement. The crusher building is about 20 ft. higher than the mill and covers an area approximately 76 ft. by 73 ft. at ground level. Both buildings were erected using "dry" construction above the foundations—an especially advantageous method in view of weather conditions during the construction period. Walls are made up of an outer and inner layer of corrugated Transite with the space between filled by J-M Fulthik rock batts. Exterior sheets were placed first, then the batts, followed by welding of the interior sheets. This 5½-in. thick insulated wall is fastened to supporting girts by Nelson stud welding. Insulation value of the wall is equal to 10 ft. of masonry, but weighs only 15 lb. per sq. ft. More than 4,000 cu. yd. of concrete and 900 tons of steel were used in construction.

In addition to the crusher and mill structures, an office building and a service building were constructed at the plant site. The office building houses all the staff and provides a change house for the men as well. The 242- by 102-ft. service building is of similar construction to the mill and crusher house. It contains a maintenance garage which is equipped to service and completely maintain pit rolling stock. It also houses a machine shop with facilities for blacksmiths, sheetmetal workers, welders, carpenters, electricians, and millwrights. The main center aisle contains a mobile crane used in overhauling, repairing, and maintaining all heavy plant equipment.

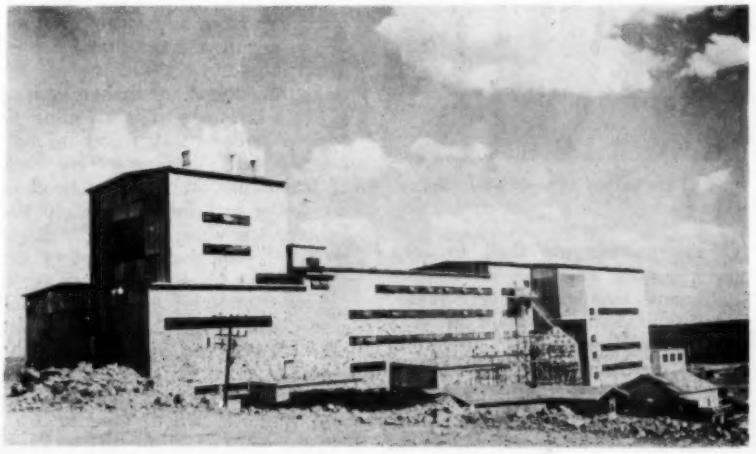
Stripping of the "A" orebody was started in August, 1949. Underbrush and trees on the site were windrowed with bulldozers, and burned; gravel was stripped from the east end of the orebody for a perimeter road in an area which had been cleared of muskeg on the south side of the pit. Upon completion of a road at the west end of the orebody, a sink cut was started there. When two 2½-cu. yd. 93-M Marion diesel shovels were received at the site, along with portable compressors and Joy wagon drills, the cut was advanced into rock. At the same time, the high east end of the deposit—which supplied the initial ore while the remainder of the orebody was being stripped—was prepared for bench mining. Of approximately 1,000,000 tons of clay which had to be removed, half was stripped in the first year. A Marion 93-M shovel rigged as a dragline was utilized to strip clay from the center of the deposit ahead of the rock cut. Overburden covering the deposit was spotty, having an average of 10 to 15 ft. of clay and muskeg. The latter is a mass of decayed swamp growth found under the forests in the area, and is partly the result of a bush fire which burned out the entire section about 20 years ago.

In mining this orebody, which is approximately 2,000 ft. long, with an average width of 200 ft., a 35-ft. bench interval is used. There is a 1:1 slope in rock and 4:1 of overburden. It has been planned to mine to a depth of 220 ft. with an expected ore waste ratio of 2½ to 1. Primary drilling is handled by three Joy dual wagon drills with 4-in. pneumatic drills on 14-ft. slides. Holes are drilled with a 2½-in. bit and charged with 2- by 16-in. 40 percent Forcite dynamite which is primed by millisecond delay caps. The drilling pattern varies from 8 ft. by 10 ft. to 8 ft. by 7 ft., depending upon the character of the material drilled. About five to six tons of rock are broken per pound of powder, and the small amount of secondary drilling required is taken care of by jackleg-mounted 45-lb. jackhammers.



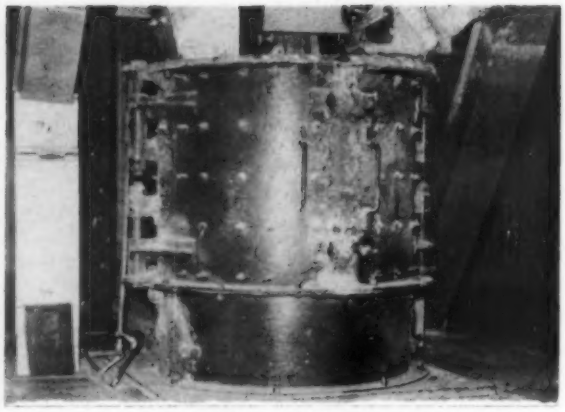
A view at the discharge end of the 45-degree slip leading to the primary crusher.

Of the three Marion shovels now used in the pit, two load out waste rock and the third loads out productive serpentine; each is capable of handling 400 t.p.h. Ten 22½-ton dump trucks, Mack and Euclid, are used to haul waste and ore to the waste pile or to the mill slips. The haul varies from ½ to ¾ of a mile, depending on the location of the pit shovels and whether the haul is to the mill or to the waste dump. In addition to the drilling, excavating, and hauling equipment previously mentioned, three Caterpillar D8 bulldozers and one Super



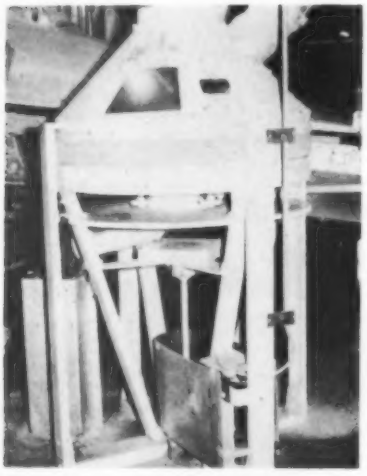
The crusher and mill buildings which were erected in 190 working days during which a temperature range of 151 degrees was experienced.

The 160-t.p.h. 4-ft. secondary cone crusher which sizes the material in preparation for drying.



Ore is passed through this 100 t.p.h. Johns-Manville designed fiberizer for separation of rock from fiber.

This view shows one of the 13 vibrating screens with its aspirating hood on the right.



One of the battery of centrifugal fiber collectors.

C Tournadozer are used to keep the pit floor in shape, level waste piles, and maintain haulage roads. Rock tailings from the mill are used for road maintenance.

The ore from the pit is dumped outside the crusher building, where an air-operated slusher bucket pulls it into a 460-ton-capacity 4- by 9-ft. slip on a 45 degree angle. The slip discharges into a Birdsboro-Buchanan Type C 36- by 48-in., 160 t.p.h.-capacity primary jaw crusher. The rock is then fed to a Symons 4-ft. cone crusher of the same capacity with a ¾-in. setting. From this secondary crusher, the material is conveyed, in series or parallel, to two Johns-Manville engineered tower dryers, where it passes through baffles in the chimney chute of a drying furnace at a generated contact temperature of 1,200 to 1,300 degrees F. The dryer discharge is conveyed up a 225-ft. gallery to the 14,000-ton-capacity dry rock storage building. Dry ore can be drawn from any of 15 draw points by three Hardinge constant-rate feeders. These portable feeders can be moved to any point; and by drawing from two or three points simultaneously, any required blend of fiber can be obtained.

Blended ore is then conveyed from the storage bins to the fifth floor of the mill, where in consecutive stages the asbestos is recovered from the host rock. In the first stage the fiber is knocked away from the rock by passing the ore through a Johns-Manville designed fiberizer of 100 t.p.h. capacity whose discharge passes a ⅞ to D screen. The resulting fiberized material then passes through a series of 13 vibrating screens, each of which has an aspirator hood at the lower end for drawing up the lighter fiber, while the heavier gauge is left to ride over the end of the screen. The fiber thus sucked up is conveyed to large cyclone collectors, where it is dropped out of the air-stream ready for grading. Since the recovery of fiber depends on the physical characteristics of lightness and fluffiness when "opened up", it is obvious that the better grade of fiber is recovered in the early stages and the lower grades toward the latter stages. Tailings resulting from these processes are conveyed up a 14-degree slope to the top of the tailings pile, where they are spread by a portable shuttle and stacker.

The asbestos, after cleaning by further screening and aspirating, is then mixed and graded to achieve the desired finished product. Grading of recovered material is accomplished by passing the fiber over screens of various mesh sizes, resulting in selection of fiber by lengths for required grade. The grade is established by the proportion of fiber of different lengths in the blend.

Bagging of the asbestos is the final operation in the mill. A Merrick Weightometer weighs the material, after which it is automatically compressed and forced into 80-lb. jute or paper bags. It is then trucked to the Matheson station on the Ontario Northland Railway for loading into boxcars. While most of the output is shipped to insulation producers and processors in the United States, there are also consignments destined for Canada, Europe, South America, and Australia. The asbestos from this Ontario mine is harsh in texture and finds particular application in wet cement products. This is in contrast to the soft fibre found at the Company's Jeffrey Mine at Asbestos, Quebec, which is the largest asbestos mine in the world. At the time of the official Munro mine opening, ore was handled in the mill at the rate of 100 t.p.h. However, the building is so designed that capacity can be doubled at any time in the future by installation of additional equipment.

The latter possibility is particularly significant in view of the fact

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SOME OF OUR CUSTOMERS are genuinely surprised at the clean, fresh, "contrasty" colors we can produce on kraft Multiwalls.

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May we show you comparative printings made by our Kolorseal process?

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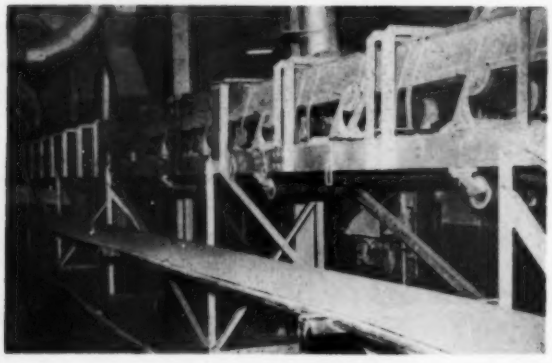
MULTIWALL PAPER SHIPPING SACKS



Upper, left: At this pressure packer, the asbestos fiber is automatically compressed and forced into 80-lb. bags.

Upper, right: A view inside the plant of the tailings conveyor which on leaving the building goes up a 16-degree slope to the top of the tailings pile.

that last year A. R. Fisher, president of Johns-Manville, announced plans for an underground mining development at the Munro mine. Sinking of an 800-ft. main shaft, which will be supplemented by a 300-ft. service shaft, was started last summer; and it is expected that the new underground facilities will be in operation in 1958. The open-pit operation started in 1950 will continue meanwhile. Included in these plans is a permanent headframe which will also serve two other orebodies in this area when greater demand for asbestos fiber warrants their development.

Low winter temperatures present a maintenance problem on Sundays, when the mill and pit are shut down. While the mill machinery is well protected, exposed equipment must be started periodically to preclude its freezing up. The three Marion diesels, for instance, are started about every 15 minutes during the periods of 50 below temperature.

With more than 250 people employed at the Munro mine, both pit and plant are operating around the clock, three shifts per day, six days a week. Key personnel of the operation include the following: Robert Baker, mine manager Frank Morton, plant engineer; W. J. Young, pit superintendent; I. F. MacIntosh, mill superintendent; and R. E. Sampson, underground mine superintendent.

JOHN PENNINGTON HOPKIN, 74, Devil's Slide, Utah, a retired foreman of the local Ideal Cement Company plant, died at his home on June 21. He had seen 42 years of service with the company.

Producer Manufactures Sand To Overcome Fines Deficiency

Crushing and sand classification facilities also improved—

another ON THE SPOT report

TRAVEL any given territory in these United States on an editorial "beat", as the writer has for the last decade or so in the area west of the Continental Divide, and one discovers certain operators who

By HARRY F. UTLEY

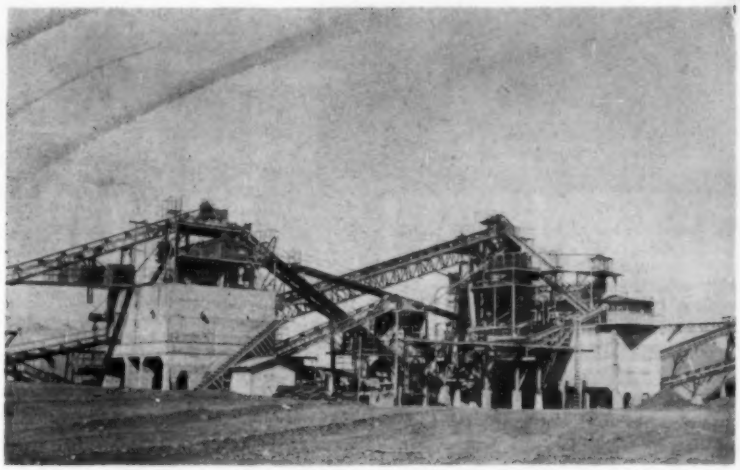
seem regularly to be doing things which provide "article material".

The Arizona Sand & Rock Company of Phoenix definitely falls into this category. On at least three occasions since the end of World War II, the concern's operations have merited attention on these pages.

Dropping in on D. W. Kelley, president, and his operating staff in the early spring of 1955, we again observed a number of interesting production changes, particularly in the sand department, which seem worthy of recording.

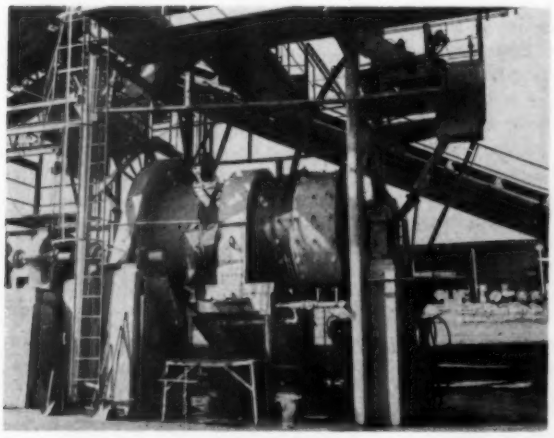
Source of the pit-run material supplying the plant, which will shortly reach the rather imposing capacity of more than 600 t.p.h., is the dry bed of the Salt River, south of Phoenix. The deposit, however, has always been notoriously short on fines and long on plus 6-in. cobbles. This oversize is wasted before it can reach the primary crusher by the use of an ingenious hydraulic-powered tilting grizzly[1] spanning the receiving hopper. A good deal of unwanted plus 2-in. rock, too, is being pulled out of the circuit in the processing plant and hauled away to waste. Meanwhile, natural sand has continued in short supply; and with present-day concrete specifications calling for more extreme fines and more precise gradation, the sand-department refinements were undertaken to correct the deficiency once and for all.

Focal point of interest, perhaps, at the Phoenix operation is a recently-installed rod mill to manufacture sand from surplus medium-range gravels. Hydro-separating devices have also been cut into the sand cycle to improve gradation, as well as to save the finest fractions from being washed away to waste.

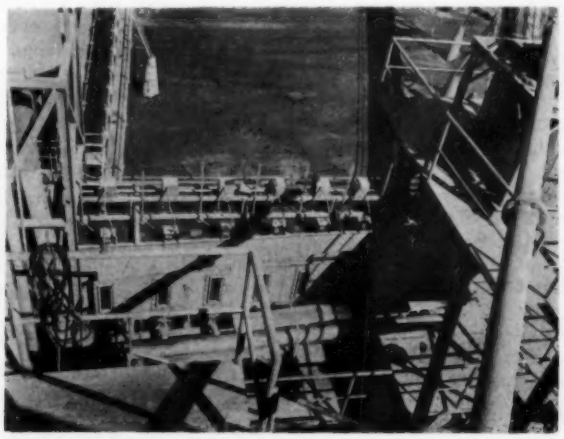


A general view of one part of the Arizona Sand & Rock Company's plant near Phoenix. At the left is the crushing department; at the right the sand-washing and sizing operations.

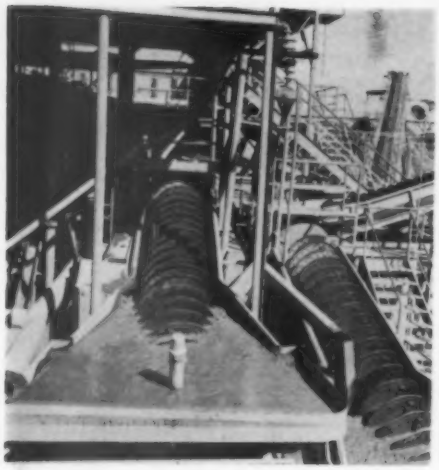
[1]See PIT AND QUARRY, January, 1953.



The new rod mill grinds surplus gravel to produce manufactured sand. The 7- by 12-ft. unit is fed from either end and discharges peripherally at the center.



This 8-pocket hydraulic sizer, recently installed, has been an important factor in improving the sand quality and gradation.



This view shows two of the four screen classifiers for sand. Just above the one at the right is a newly-installed dual wet-cyclone which extracts extreme fines from the waste overflows from the screws.

The central-mix concrete plant is across the highway from the aggregates plant. Aggregates move by way of a conveyor running under the road and up to the batch plant bins.

The plant framework and supports are now entirely of concrete and steel, replacing some old timber structures. Equipment is interlocked, with all controls now centralized in a control house high up in the plant.

After an initial pass by a primary crusher beneath the receiving hopper, the material is carried by a 263-ft. long conveyor to build up a surge supply pile of about 6,000 tons live-storage capacity. A Transportometer was recently installed on this belt to record the rate of feed to the pile.

Recovered by tunnel belt, the material hits a set of 5- by 12-ft. wet screens, where the oversize is first scalped off and sent to the "dry" (or crushing) department before the screens wash and size the gravel. The plus 1- or 1½-in. material is surge-binned in the crushing department before it is subjected to crushing by a pair of Allis-Chalmers 636 Hydrocones, followed by a pair of 322 Hydrocones for final reduction. Early this summer, however, a 651 Hydrocone is to replace one of the 636 machines which, in turn, will supplant one of the existing 322 units, to increase crushing output and improve size control. Crushing equipment is in closed circuit with a set of vibrating sizing screens.

Sand from the wet screens is sent to a rotary splitter which cuts it about 60-40, the larger proportion going to four Wemco screw classifiers while the remainder is fed to a new Dorrco 8-pocket sizer for hindered-settling hydraulic classification.

Overflow from two of the screws is now being pumped up to a Krebs dual wet-cyclone to extract needed fines in the 100- to 325-mesh bracket from the waste and water. This fine sand is blended into the finished sand circuit.

Additional sand requirements are now being manufactured by an Allis-Chalmers 7- by 12-ft. rod mill, fed wet at both ends and discharging peripherally at the center. Feed to the mill normally consists of ½-in. crushed material from the "dry" plant. The milled sand is re-introduced into the flow-sheet at the sizing screens on the wet side for processing with the natural fines.

Finished coarse aggregates, which normally do not exceed 1 in. in top size, along with the concrete, plaster, and other grades of sand, are stored over a recovery tunnel for reclamation as commercial aggregates, or for utilization by the company.

The modern, fully-automatic Johnson Octo-bin concrete central-mixing plant operated by the company is located across the road (an extension of South 7th Street) and is supplied with aggregates by a belt-conveyor which operates in a tunnel beneath the road and continues up to the top of the concrete plant bins. Currently the company is operating about 40 truck-mixers to serve the construction demands of the Phoenix area, a demand that has continued with unabating volume for more than a decade as people, industry, and commercial ventures flock to the Valley of the Sun.

Besides the ready-mix department, Arizona Sand & Rock Co. also produces bituminized aggregates and bagged dry concrete mixtures and mortars.[2]

[2]See Pit and Quarry, November, 1952

The company also operates a portable aggregates plant, a Pioneer 46VE unit, to fulfill contract commitments some distance from the permanent plant in Phoenix. It is, of course, imperative that this rig be maintained at top operating efficiency since time is always of the essence on contracts of this kind. Consequently, the portable has been equipped with various fixtures to permit use of the latest high-speed, semi-automatic equipment for the application of Stoody hard-facing rod to compensate for wear on the crusher rolls, etc.

Formerly, when manual electrodes were used, welding time often ate into valuable daylight hours, when the equipment should have been processing gravel and sand. Now, using the fast, semi-automatic hard-facing techniques, the work can be entirely completed on the night shift, enabling the plant to crush and classify material on a full 16-hr. schedule.

Similar hard-facing procedures are regularly employed at the Phoenix plant.

U. S. Gypsum Seeks Permit For Plant Near New Orleans

It has been revealed that the United States Gypsum Company has applied for a permit to construct buildings to cost $1,491,399 for a plant near New Orleans, La.

According to reports from New New Orleans, the company intends to erect an office building, a machine shop, a locker building , a plant, a warehouse and packing department, and a kettle mill. The structures are to be of concrete block and steel.

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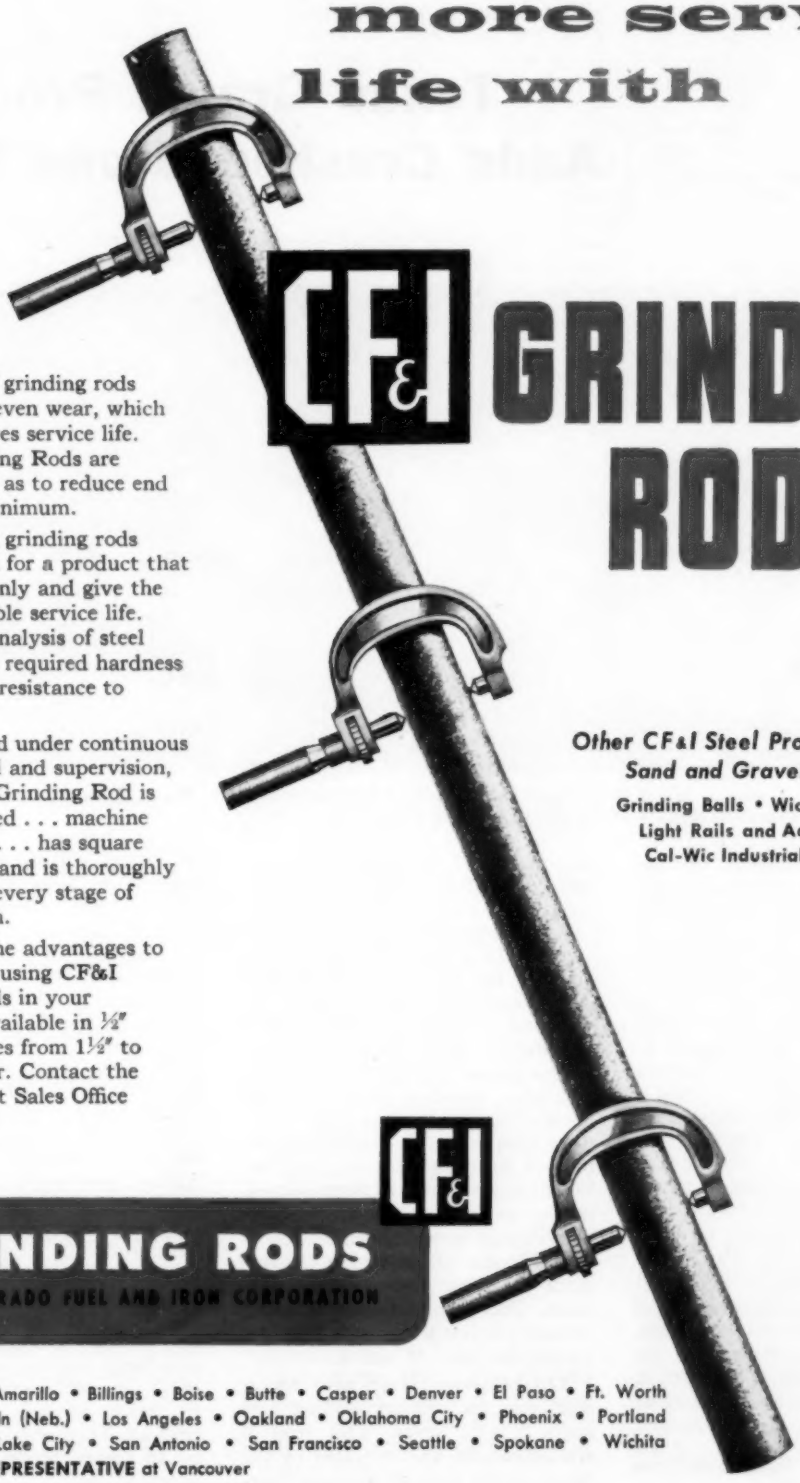

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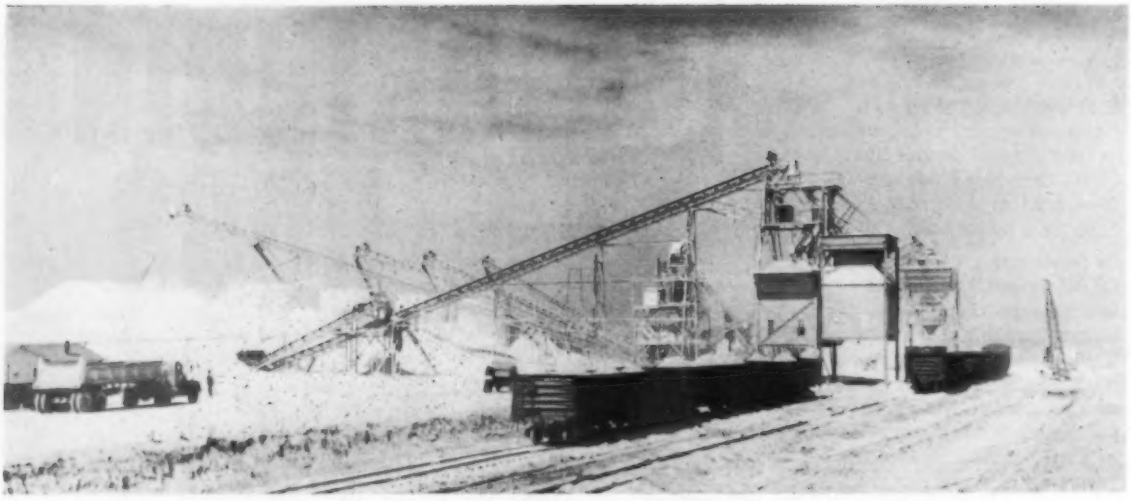
3187

Many gravel plant practices incorporated in operation as

Texas Gravel Producer Adds Crushed Stone Plant



A general view of the Bridgeport stone plant of Fort Worth Sand and Gravel Company. The stone silos are on the left and the truck and rail bins on the right.

another ON THE SPOT report

ABOUT two years ago the Fort Worth Sand and Gravel Company* expanded its operations by building a new, modern, 200 t.p.h., crushed stone plant near Bridgeport, Tex., about 50 miles north of Fort Worth. The new venture was tackled in order to enable the company to counteract the ever-growing problem of depleting sand and gravel aggregate reserves in the Dallas-Fort Worth market area. Further, the Bridgeport deposit is a high-calcium limestone which has opened up new markets (like fluxstone) for the progressive Fort Worth firm.

Having years of experience in the sand and gravel business, the owners naturally incorporated many gravel plant practices in the new operation. Of noteworthy importance are the methods of stockpiling, reclaiming, and washing the products, as well as the use of a large surge pile and large-capacity loading-out scales. The stockpiling arrangement features the use of four large concrete silos and intervening ground storage areas. Stone is reclaimed by a tunnel blending belt conveyor, and washed in a twin-screw classifier prior to shipment. The new plant started operation in April, 1953.

The quarry is being developed on a hillside location about 4 miles north of Bridgeport in a major limestone area where two other companies are operating. Earlier, the Fort Worth quarry site had been opened up by a portable plant engineer. The deposit is well bedded, and is suitable for construction aggregates, fluxstone, and chemical purposes. The present quarry is being worked on one level, with the face varying between 57 and 65 ft.

The Mayhew (Hurricane) rotary drill used for primary drilling puts down 5½-in. holes. This drill is truck-mounted and operated by the truck engine through a power takeoff; it has a 31-ft. mast. Normally seven 60-ft. holes are drilled in a 10-hour shift. Cuttings from the holes are blown out by air supplied by a Gardner-Denver 580-cu. ft. air compressor driven by the truck engine through power takeoff. The drilling pattern is 12 by 22 ft., with three rows (15 to 30 holes) shot each time. Hercules 60 percent gelatin (4½-in. cartridges) is used. Detonation is achieved with Primacord, one electric cap, and millisecond delays between the rows. Secondary breakage is handled by black-hole shooting.

Quarry loading is done with a Northwest 80D shovel, powered by a Murphy diesel engine and mounting an Amsco 2½-cu. yd. bucket. Haulage to the stone plant is *via* a fleet of three Easton Model TP-1317 side-dump trailers, with a capacity of 17 tons each, which are powered by gasoline-driven White 130-hp. tractors. These trailers are dumped by an Easton Model HE-20 electric overhead hoist.

*The firm became affiliated with Texas Industries early in 1953.

Quarry cleanup is handled by a Caterpillar D7 tractor-bulldozer.

The primary crusher is a Pioneer 30- by 42-in. jaw crusher, V-belt driven by a 125-hp. motor; it is fed from a 30-ton capacity hopper mounted over a Pioneer 48-in. by 14-ft. apron feeder. The crusher product is carried by a 42-in. belt conveyor to a Hewitt-Robbins Gyrex 5- by 12-ft. single-deck scalping screen.

Plus 6-in. stone is chuted to a Pioneer 1536 jaw crusher for secondary reduction; this crusher, driven by a 75-hp. motor, is operated in closed circuit with the scalping screen, the return being effected by a 24-in. belt conveyor serving the No. 1 belt.

The scalping screen throughs are taken by a 30-in. by 125-ft. belt conveyor to a second scalping screen, which takes out the clay fines. This screen is a Gyrex 5- by 12-ft. two-deck unit. The fines are collected in a 21-cu. yd. bin and trucked to a waste area, while the desired product is carried on a 30-in. belt conveyor to the surge pile. The minus 6-in. stone from the surge pile is then reclaimed by a Jeffrey electric vibrating feeder and carried by a 30-in. belt conveyor to the tertiary crushing station.

In the original plant layout following the surge pile, the stone was crushed in a Symons 5½-ft. cone crusher and then sized by a pair of Gyrex three-deck screens, which were operated in closed circuit with the cone crusher. The products were then belt-conveyed to the silos and stockpiles and later reclaimed by a belt conveyor system to a combined rail-truck loading bin.

In order to add flexibility to the operation, permit the production of special sizes, and speed up the loading operations, the following changes were made during the late spring of 1954. A Tyler Ty-Rock F-600 double-deck scalping screen was mounted ahead of the cone crusher, a third vibrating screen was added ahead of the two finish screens at the screening tower, and a double roll crusher was installed in the circuit to produce fines when desired. Now the roll crusher rather than the cone crusher is close-circuited to the finish screens. In addition, a new belt conveyor was set up to carry special sizes from the screens to a new rail-loading bin. Finally, a double-screw washer was added following the stockpiles, to wash fine and coarse aggregates before shipping.

Returning to the flow, the stone from the surge pile is fed to the Tyler Ty-Rock F600 double-deck screen, the plus 2¾-in. being fed to the Symons, and the minus 2¾-in. being sent to the screening tower.

The product is then taken by belt conveyor to the screening tower, where three Gyrex screens and a Universal 24- by 30-in. double-roll crusher produce the finished products. The screens, mounted in series, consist of a 5- by 12-ft., 2-deck unit which is followed by two 6- by 14-ft. 3-deck units. The roll crusher is fitted with one smooth and one corrugated roll and is V-belt driven by a 75-hp. motor. Five 18-in. and one 24-in. inclined conveyor belt finger out from the south side of the screening tower, leading to the stockpile area.

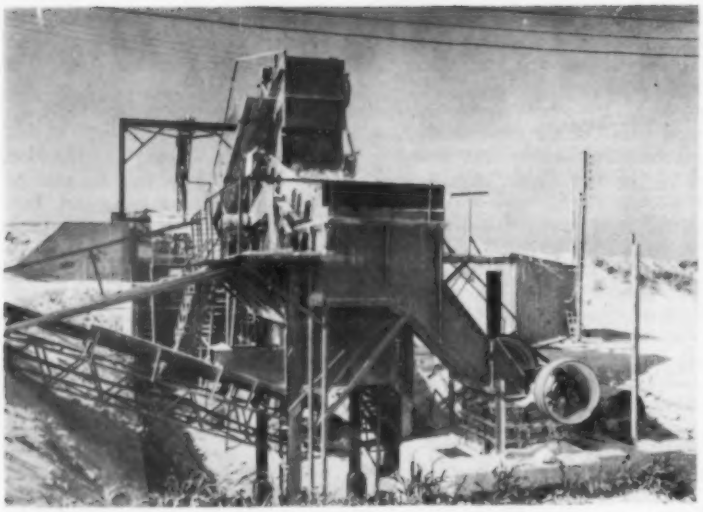
When the plant was visited, the screens were fitted with wire cloth having the following openings: first screen, 1½-in. and 1-in.; second screen, ¾-in., ⅝-in., and No. 8; and third screen, 7/16-in., ½-in., ¼-in., and No. 8. Any combination of 2¾-in. to ¾-in. can be sent to the rolls or the loading-out bin. Finished products of the two 3-deck units, ranging from 1-in. stone to screenings, are carried by five conveyors to the stockpile area.

To permit the stockpiling of a variety of stone sizes, the company arranged the concrete silos in a single row, with considerable space between each unit, in order to allow

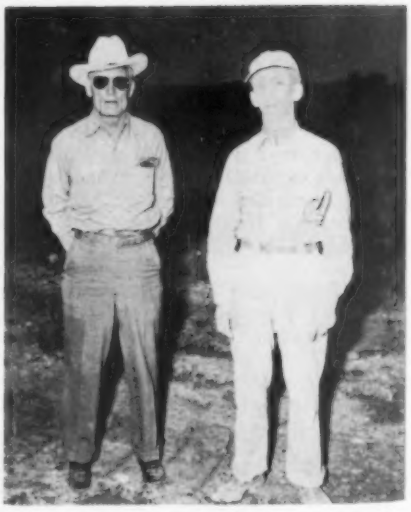
Left: A quarry loading scene showing the 2½-cu. yd. shovel, the side-dump trailer, and the 60-ft. face.

Right, above: The 17-cu. yd. side-dump trailer at the primary crushing station.

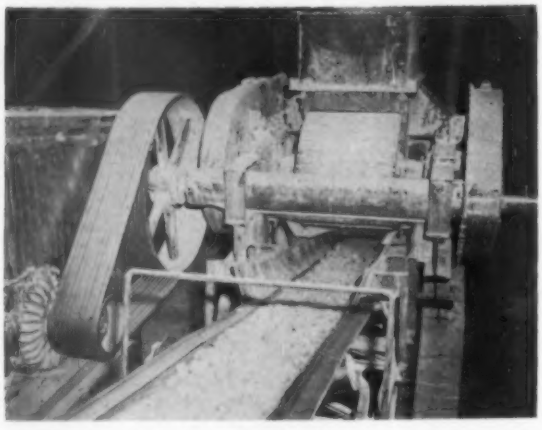
The truck-mounted rotary drill which puts down 4¾-in. holes.



The 5- by 12-ft. primary screen and the 15- by 30-in. secondary jaw crusher, which reduces plus 5½-in. stone scalped from the screen. (Primary crushing station in background.)



W. R. Thomas, Fort Worth production manager, and Carl Roland, Bridgeport superintendent.



Above: Fine reduction is accomplished in this 24- by 30-in double roll crusher.

Below: The finish screen tower (left) and 120-ton rail loading bin (right).

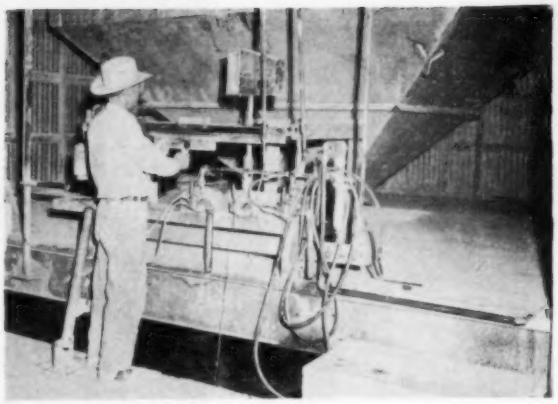
Above: Before being shipped, the stone is washed in this 7- by 22-ft. double-screw classifier. The conveyor on the left carries the washed product.

Rail cars are moved by this car-switching unit, which has pneumatic-tire wheels for ground operation and flanged wheels for moving the cars.

build-up material between the silos and at the ends. Each silo measures 36 ft. by 32-ft. I.D., and has a capacity of 700 tons. The stacking conveyors are fixed and discharge directly to the silos (except the No. 6 stacker, which discharges to a screenings stockpile). Special chutes are used to take the material to the other stockpiles.

The stone is reclaimed through 16 gates to a blending tunnel belt conveyor, and it is fed by an inclined belt conveyor to the loading-out station. For washing purposes, there is a by-pass conveyor leading to an Eagle 7- by 22-ft. double-screw classifier. The latter is driven by a 50-hp. motor. Each screw is 36 in. by 18 ft. and has a single paddle at the discharge end. Some stone sizes taken from the stockpiles are washed before shipment. For a final cleaning operation, when this is necessary, a two-deck screen is being installed over the bin station.

Two Blaw-Knox bins are used. One, which serves for rail car loading, has a single compartment with a capacity of 100 tons; it is served by a 40-ton Fairbanks-Morse scale. This large-capacity scale permits a one-shot weighing operation for the smaller rail cars. The second bin has four compartments and a capacity of 160 tons; it is equipped with a 10-ton Fairbanks-Morse scale and is used only for truck loading. To facilitate the loading operation, the gates for the bins and weigh batchers are air operated. The third loading point (mentioned earlier) consists of a three-compartment 120-ton bin and a 10-ton scale; it is used for both truck and rail car loading. Rail car movement at the plant site is facilitated by a motor-operated Clyde car puller installed at the loading station and by a Whiting Trackmobile.



A worker is using a 40-ton scale for rail-car loading. Gates for the overhead bin and batcher are air-operated.

N.Y. Land Options Purchased By Lehigh for Exploration

Joseph S. Young, president of Lehigh Portland Cement Company, has confirmed the report that his firm is buying land option in the Sackets Harbor, Camp Mills, and Smithville areas of New York, but added that the purchases are only an "exploratory" project with its possible development "years away".

Termed a "wildcat operation" at this stage by Mr. Young, he continued, saying "that should future tests prove the land feasible for development it may be utilized as a quarry to provide a reserve limestone area for Lehigh's cement plant in Buffalo."

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View showing discharge end of the Simplicity 3' x 10' Grizzly-Feeder.

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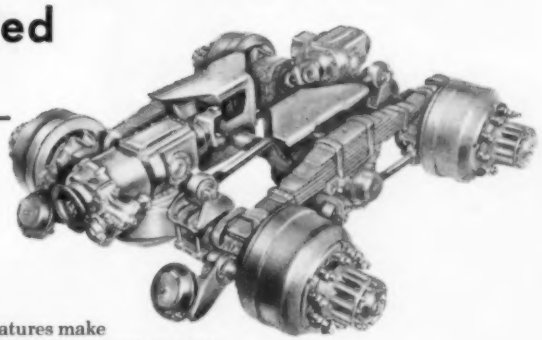

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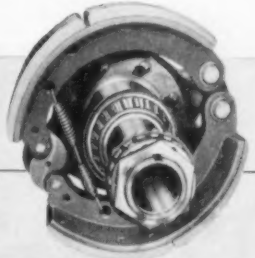

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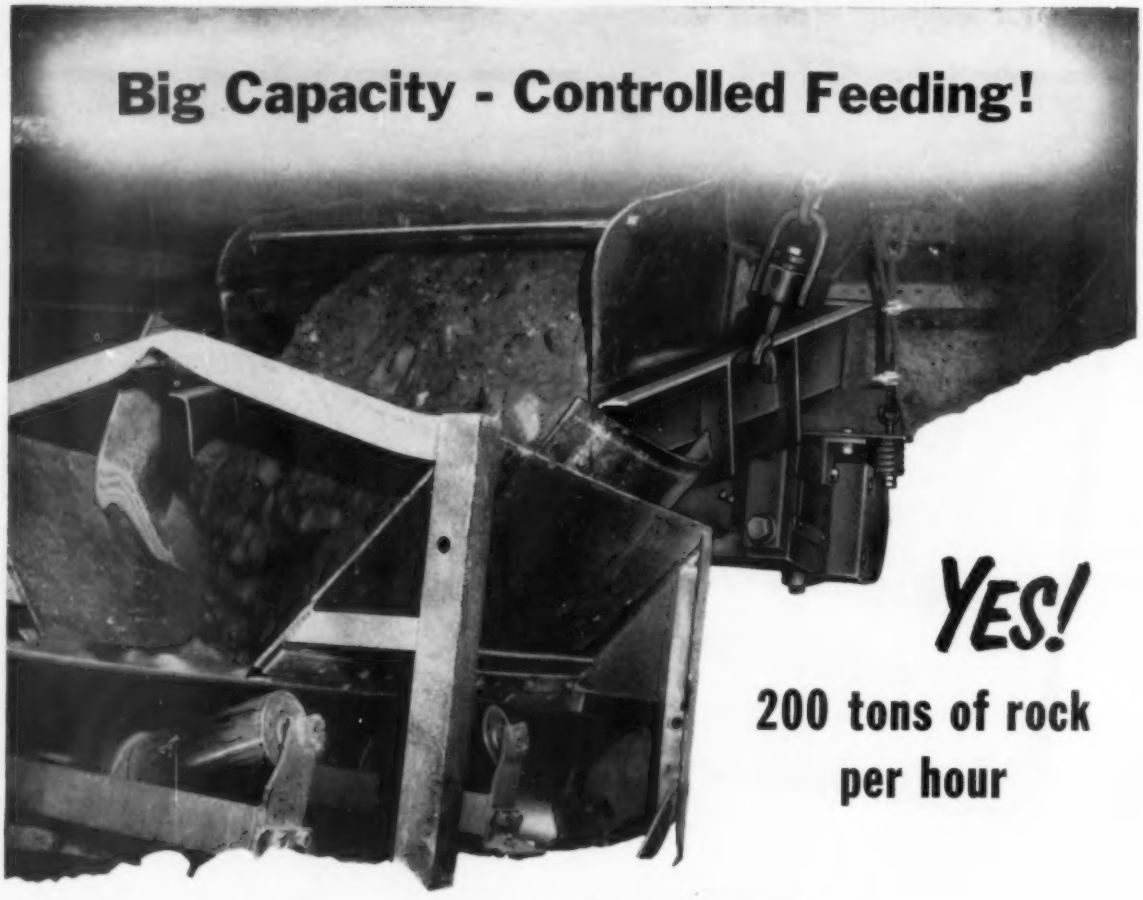

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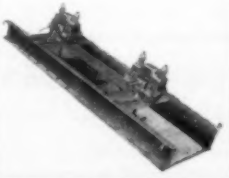

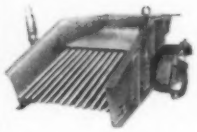

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Crushed Stone Directors Meet at Hot Springs, Va.

Important Association and Industry Problems Discussed and Acted Upon

another ON THE SPOT report

THE board of directors of the National Crushed Stone Association held its annual mid-year meeting at The Homestead, Hot Springs, Va., July 14 and 15, 1955. The meeting was well attended by members of the board as was also a meeting of

By WALTER E. TRAUFFER

the executive committee of the Manufacturers' Division. Both sessions were presided over by T. C. Cooke (Lynn Sand & Stone Co., Swampscott, Mass.) president of N.C.S.A. In his opening address Mr. Cooke paid tribute to the memory of two long-time members of the board, Otho M. Graves and L. J. Boxley, who had passed on since the last meeting. Action was taken later in the meeting to elect Abner Boxley (Blue Ridge Stone Corp.) to fill the position of director held by his brother and to replace him as vice-president of the Southeastern Region with Nelson Severinghaus (Consolidated Quarries Corp.).

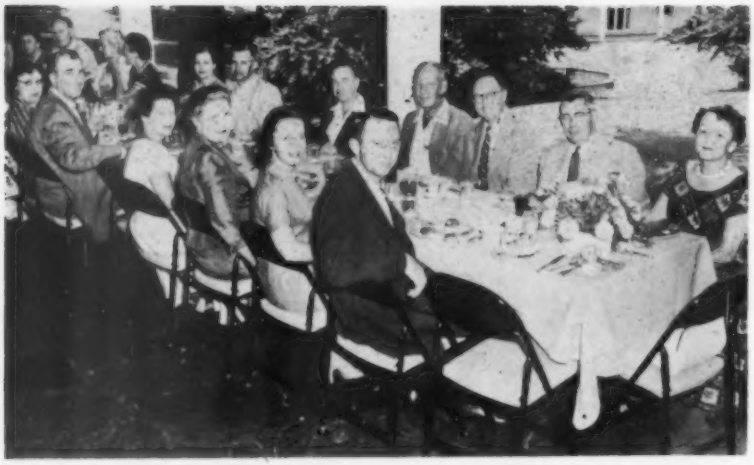
Coming Meetings It was decided that the 1956 mid-summer board meeting is to be held at the Lake Placid Club, Lake Placid, N. Y., July 12 and 13. The 1957 meeting will be held July 11 to 13 at The Homestead. The 1956 annual convention and machinery exposition, of course, will be at the Conrad Hilton, Chicago, February 20 to 22. By almost unanimous vote it was decided to hold the 1957 annual convention in Miami Beach the week of January 13. Headquarters and meetings will be at the Sans Souci Hotel and accommodations will also be available in the nearby Saxony, Seville, and Sea Isle Hotels. Special off-season rates will also prevail for three days before and after the convention.

Administrative Directors In his report J. R. Boyd, administrative director of N.C.S.A., covered matters of importance which had developed since the last meeting in February. The association now has 135 active members. Two new members are Derbyshire Stone Ltd., Matlock, Derbyshire, England, and National Lime & Stone Co., Findlay, Ohio. There are now 109 members of the Manufacturers' Division, additions since the Convention being: American Hoist and Derrick Co., St. Paul, Minn.; Boston Woven Hose and Rubber Co., Boston, Mass.; Dart Truck Co., Kansas City, Mo.; Eagle Crusher, Inc., Galion, Ohio; Lippmann Engineering Works, Milwaukee, Wis.; and William Patent Crusher and Pulverizer Co., St. Louis, Mo. The Association, Mr. Boyd reported, is also in excellent financial condition.

One of the most important developments affecting the crushed stone industry was the legislation before Congress which, Mr. Boyd said, gives positive assurance of a multi-billion dollar highway construction program over the next several years. The Senate and House versions of proposed new federal-aid highway legislation are, he said, substantially divergent in several important details, particualrly with regard to method of financing, but both call for a greatly-expanded program of highway construction with federal-aid funds. He described both bills in detail and the procedure which must be followed before any such bill becomes law.

The future highway outlook, according to Mr. Boyd, is most promising, but the full impact of the expanded program is not likely to be felt until mid-1956 or 1957. A survey of the 48 state highway departments recently completed by the American Road Builders' Assn., estimates that expenditures for highway construction in 1955 will be $2,226,445,000, an increase of $233,894,000 over 1954. Maintenance expenditures, it is reported, will amount to $595,-

Left: James Savage (Buffalo Crushed Stone Corp.); Horace C. Krause (Columbia Quarry Co.); Clarence Camp II (Camp Concrete Rock Co.); J. V. Owens (Eastern Rock Products, Inc.).
Right: Three pioneer members of N.C.S.A. still active greet a retired member. Left to right: O. M. Stull, (Liberty Limestone Corp.); Henry E. Rodes, retired, president of N.C.S.A. 1936-7; James Savage (Buffalo Crushed Stone Corp.); J. A. Rigg (Acme Limestone Co., president of N.C.S.A. 1940-1.



In this luncheon group on the Casino Terrace are: O. M. Stull, Oscar E. Benson, G. A. Austen; R. E. Sansom; T. C. Cooke, Bruce G. Woolpert, and J. V. Owens.

509,000 in 1955, an increase of $21,907,000 over 1954.

The association maintained its historical position of opposing increased freight rates on its commodities by filing a statement opposing the increase requested by the railroads on April 15, 1955. On that date the railroads filed a motion with the Interstate Commerce Commission urging that the temporary 15 percent freight rate increases granted on April 11, 1952, be made permanent without further hearings and the proceeding be discontinued. Lacking action to the contrary, these increases would expire at the end of 1955. The association filed its statement on July 5, 1955, reaffirming the position previously taken, and with minor revisions to bring it up to date.

Mr. Boyd expressed his opinion that it would be most timely to investigate the possible desirability of revising the Association's Cost Accounting Manual in view of the many changes which the last 18 years have witnessed in the tax laws and possible important changes in production procedures. He reminded the board that a Manual of Uniform Cost Accounting was first developed in 1930 and 1931. In 1934 the Code Authority for the crushed stone, sand and gravel, and slag industries prepared uniform cost accounting manuals for the three industries. Again in 1937 the manual for the crushed stone industry was revised to eliminate all matter originally included to meet the requirements of the Code. That was 18 years ago, and there have been no revisions since.

It is interesting to note, said Mr. Boyd, that requests for copies of this manual are still being received, especially since the granting of percentage depletion to the crushed stone industry and the accompanying need for more precise accounting practices. The revision of this manual would not be too difficult or costly, he said, and would be invaluable to the industry. He recommended that a preliminary study of the situation be made and a report submitted to the board of directors.

Another luncheon group—on another day—included: Russell Rarey, Norman E. Kalb, Joseph E. Gray, John H. Odenbach, Arthur Goff, O. M. Stull, J. Reid Callanan, and Oscar E. Benson.

Engineering Director In his report to the board A. T. Goldbeck, engineering director, briefly summarized the work to be done by his department during the past year. Many problems then confronting the industry have been solved, but he pointed out that others have not and there is no ready answer for them. These continuing problems include: alkali-aggregate reaction; slippery pavements; certain gradation problems, including flat and elongated pieces. With respect to alkali-aggregate reaction, he said, tests indicate clearly that the addition of pozzolanic materials such as fly ash is decidedly beneficial and the universal use of a pozzolanic cement would be an effective cure. He predicted that such a cement will be used more in the future as the technology of its production and use are developed.

Slipperiness, said Mr. Goldbeck, is still with us, but its importance has recently been accentuated and extended in its application to bituminous pavements. Such pavements have always been slippery when wet but now the blame is being laid to the aggregate, perhaps with some justice in certain cases. Laboratory tests have shown that if a fine aggregate is being used for pavement concrete which experience has shown will be slippery in a short time, the embedment by vibration of a relatively small amount, five to seven pounds per square yard, of very hard, coarse sand into the surface during construction will overcome the slipperiness difficulty. In pavements where coarse aggregate wears down to a polished surface the use of silica sand in the mix will help.

Mr. Goldbeck listed the approximately 40 laboratory projects undertaken during the past year. These ranged from investigations of the quality of stone in core drill samples to rather complicated investigations of bituminous concrete, portland cement concrete, and special mixtures involving proposed new cementing materials. He also stated that the latest revised copy of Bulletin No. 11 on concrete proportioning continues to be in demand.

Among the many field trips made

by Mr. Goldbeck during the year was attendance at a meeting of the Steering Committee of the Committee on Concrete Design of the American Concrete Institute—he is chairman of the Subcommittee on Slab Dimensions; length, breadth, and thickness design. He also attended the annual meeting of the American Road Builders' Association to present a report as chairman of the A.R.B.A. Task Force on Materials for the proposed $101,000,000,000 Highway Program.

In closing, Mr. Goldbeck said that members of N.C.S.A. might receive more benefit and members of the staff might be of greater usefulness if there was more contact between them with respect to future trends in construction and specifications. He suggested that working committees would help to guide the industry with respect to future developments and perhaps even ward off undesirable trends before they get too firm a hold. There is considerable talent of various kinds among N.C.S.A. members, said Mr. Goldbeck, and ways should be devised to use that talent for the benefit of all.

Engineer Field Joseph E. Gray, field engineer, in his report to the board first reviewed his past work, a large part of which was liaison service between producers and the laboratory staff of the Association. One producer was having trouble with the usual sodium sulfate soundness test yet the product stood up well under the rapid freezing and thawing test. This latter test, he suggested, may correlate better with actual field performance. Selective quarrying was advised for another producer who had strata of chert which would not meet the sodium sulfate test. In an area wheere slipperiness of pavement is a problem a group of producers are giving consideration to the idea of financing a cooperative field experiment to study means of overcoming slipperiness. This, he said, is a promising step because the nature of the problem requires actual field construction and experimentation before much tangible progress can be made.

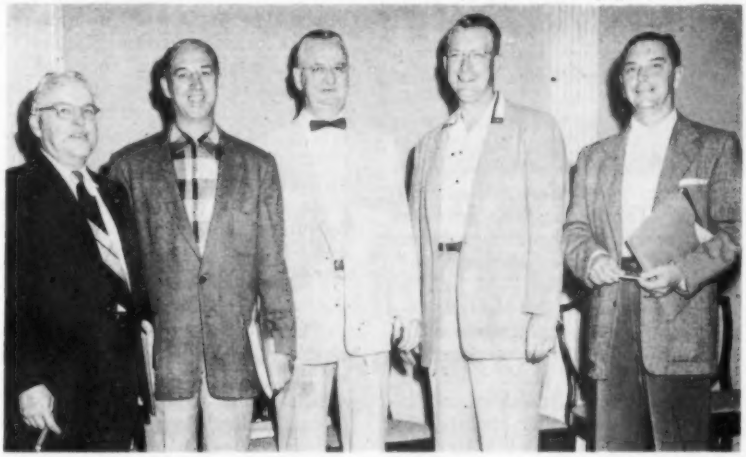
The "meanest technical problem" confronting both producers and engineers, said Mr. Gray, is that of particle shape, and this problem has been occurring with increased frequency. What makes this problem so disconcerting is: First, that there are a number of methods of measuring shape of particle, some of which are good and others are indefinite and bad; Second, there is no fixed ratio of length to width, width to thickness, ratios varying from 2:1 to 5:1; Third, the percentage of flat and elongated pieces allowable varies over a wide range, depending upon definition and use plus personal experience of various engineers, and Fourth, there is no history of failures either in portland cement concrete or bituminous concrete that can be attributed to stone of poor shape.

The fact is, said Mr. Gray, that it is impossible to establish a percentage of flat and elongated pieces which would separate good and bad performance based on service record. Yet, it must be admitted that trouble has occurred in the design of mixes and in surface treatment work due to poor shape of aggregate. Therefore, while it must be accepted that aggregate containing excessive amounts of flat and elongated pieces is objectionable, he pointed out that there is no factual basis upon which to write a sound specification with respect to this property of aggregates; hence, the dilemma.

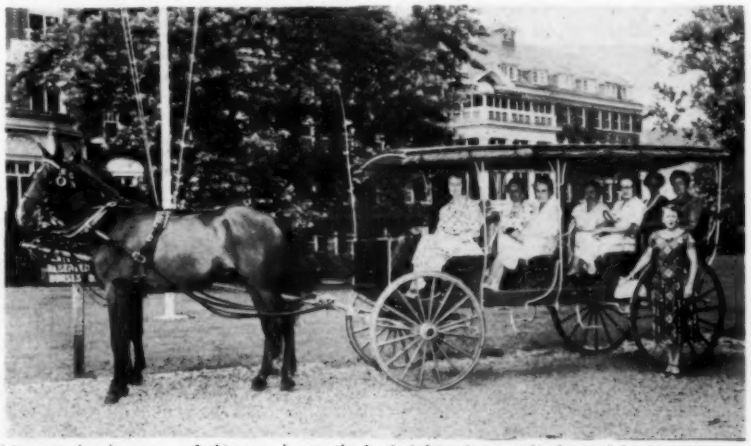
According to Mr. Gray there are several trends in road building that may have considerable effect on the future business of some producers. One is the possibility of large stone in waterbound macadam losing out to stabilized or graded aggregate base construction. The other trend is toward bituminous concrete base courses in place of penetration macadam. He pointed out, however, that the Ohio Turnpike is designed with penetration macadam shoulders, an almost ideal use for this type of construction.

In closing Mr. Gray expressed the feeling that he is spreading himself too thin and outlined an idea he would like to use for the expansion of his work. This idea, he said, culminated from talks with a good many active producers, and is intended for more effective promotion of crushed stone. In the past his promotional work has consisted of giving technical

(*Continued on page* 152)



Members of the executive committee of the Manufacturers' Division are, left to right: Wayne W. King (W. S. Tyler Co.); Richard D. Ketner (General Electric Co.); Chairman B. R. Maloney (E. I. du Pont de Nemours & Co.); L. A. Eiben (Northern Blower Co.); and Irwin F. Deister (Deister Machine Co.).



Many took advantage of this popular method of sightseeing on the beautiful and extensive grounds of The Homestead.

Helical Gearing for Mill and Kiln Drives

MARKED progress has been made in the design and operation of mill and kiln gearing employed in processing mineral ores and cement materials. The objectives in this endeavor have been the elimination of costly shutdowns and the attainment of improved efficiency, economy, and prolonged life. This has been accomplished to a degree that has surpassed every expectation.

By W. P. SCHMITTER
The Falk Corporation, Milwaukee, Wis.
Vice-President — Chief Engineer

Single Helical for Modern Mills and Kilns

Some years ago a distinct trend toward single helical designs became apparent. This can be attributed directly to the success experienced in certain pilot installations of that type and indirectly to the difficulties encountered with spur mill and kiln gearing. The herringbone gear had also been employed rather extensively up to that time, although with occasional difficulties that will be described later. In the interim, as a result of rigorous explorations of the total economic factors, the trend has progressed to the point where the great majority of multiple mill installations are being fitted with modern single helical gear sets. Many kilns, likewise, are being so specified.

Figure 1 shows a pioneering application of single helical kiln gearing that was installed in 1927. This kiln is in operation today, and the gears have never been replaced. It constitutes one of a number of successful pilot installations that justified the confidence with which engineers subsequently began adopting this design so extensively. When proportioned according to the standards of the American Gear Manufacturers Association and installed with proper alignment and adequate enclosures and lubrication, no troublesome wear of single helical gears or pinions will be encountered during the life of the associated equipment.

Figure 2 illustrates a more recent helical gear and kiln installation. The motor, speed reducer, and mill pinion assembly are all mounted on an adjustable base plate, permitting accurate initial alignment of the mill gear train and subsequent corrections to compensate for settling of foundations or for riding-ring wear. After five years of continuous operation the gears are perfect in every respect.

Nature of Loading in Mill Gearing

There is an impression in lay circles that the total load sustained by the gear elements is solely that which comes from the motor and is transformed into useful work at the driven equipment. Such is not the case. A second source of loading arises from the presence of discrepancies in the tooth curvatures and variations in tooth spacing; this is appropriately termed the dynamic or increment load. The magnitude of the supplementary stresses thus imposed on the gear teeth is dependent not only upon the extent of the gear inaccuracies, but also upon the relative ease with which the mass elastic system accommodates itself to their presence.

Where we have a highly rigid system, compensation for the disturbing error is largely by strain, *i.e.*, elastic deformations that involve correspondingly high stresses. If, on the other hand, the offering gears are contained within a highly elastic system, or one of low effective masses, a greater part of the correction will be made outside the gear elements themselves; the instantaneous velocities of the gear elements will vary in response to the demand placed upon them because of the inaccuracies of the teeth. In either event, the increment loads will be dependent, in magnitude, upon the speed and the elastic characteristics, as well as the extent of the deviation from ideal tooth forms.

A third source of tooth loading arises from the tumbling loads in the kiln or mill. This action produces energy surges which react upon the revolving masses of the gear system, producing vibratory torques which are reflected in still further supplementary tooth loading. The potential energy of the elevated material in the shell is translated into kinetic energy in the course of falling, and a portion of this variable

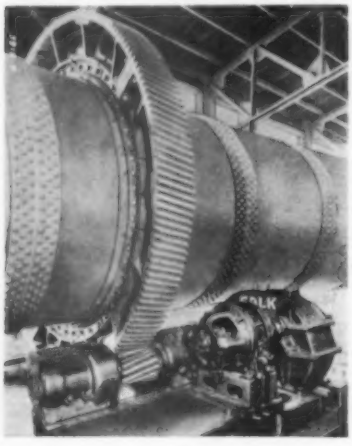


Fig. 1. Left: An early single helical gear drive with original gears still in use.

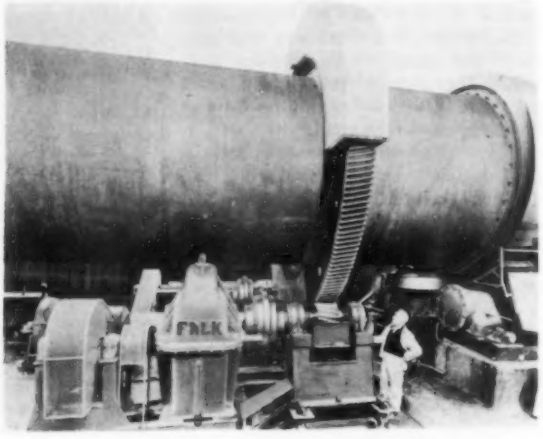


Fig. 2. Right: A modern installation of helical gearing which profits by advantages listed in this article.

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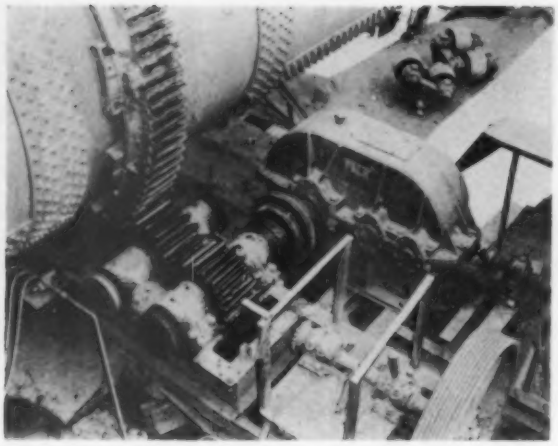

Fig. 3. A modern right angle triple reduction speed reducer which provides relief from distortional stresses.

energy must be absorbed in the gear system as potential energy of strain. This adds still another increment of stress at the tooth surfaces and at the roots of the gear teeth. Here again, the degree of supplemental gear loading is dependent upon the character of the mass elastic system as well as the magnitude of the reactionary surges.

The recommended practices of the American Gear Manufacturers Association include service and application factors which take into consideration the general character of the system as well as the amount of shock to be expected for any particular class of driven equipment. Rod mills, ball mills, and pebble mills include a ball or rod charge in addition to the material being processed; thus they require a larger service factor than kiln gears. The main gears of a kiln drive call for an application factor of unity; mill gears are designed with an application factor of one and one-half against the calculated horsepower load.

A fourth source of gear loading encountered occasionally on certain types of installations is resonance. This occurs only when there is a coincidence of the periodicity of a disturbing force with the natural frequency of the mass elastic system. This phenomenon is more generally associated with reciprocating prime movers or driven equipment having similar characteristics; however, it has been experienced on kiln drives and, in rare instances, on mill drives. The disturbing stimulus in such a situation may be the impulse rate of the cascading material. Rough spur mill gearing is also a possible source of resonance if the tooth frequency coincides with the natural frequency.

One solution lies in tuning the system so that it cannot be excited critically, another in resorting to dampening means. Dual drives are employed advantageously to avoid the possibility of critical speeds. The arrangement leads, incidental to the employment of two pinions, to a considerable reduction in the proportions of the gear elements and may result in overall economies where the horsepower is in excess of 150.

Early Spur Gear Drives

Early kiln drives comprised of several sets of rough spur gears and belted pulleys, archaic and inefficient as they might appear, did manage to keep the kiln turning over, between breakdowns. The variations in angular velocity of the rotating kiln were readily detected with the naked eye, the shell moving in impulses coincident with the tooth contact frequency of the main gears. Extensive profile wear was responsible for the kinematical distortions which lead to increased stresses and loss of efficiency. As a consequence, the operators were faced with frequent shutdowns for repairs, particularly of the higher speed elements.

It was finally decided to replace the initial trains with a modern right angle triple reduction speed reducer as shown in Figure 3, which provided much needed relief. It is interesting to note the necessity for imposing an idler between the low-speed pinton and the mill gear in order that the housing of the speed reducer clear the shell. This is most unusual; it arises from the fact that the ring gear, judged by the A.G.M.A. Standard for Rating Spur Gears, is decidedly undersize. With proper proportions, the ring gear would extend sufficiently beyond the periphery of the kiln to accommodate the reducer. The practice on spur gear mill drives, altogether too frequently, has been to ignore the A.G.M.A. recommended practice, and *compute sizes by some rule of thumb procedure which takes advantage of the fact that it will take the gear a long time to wear out and that pinion replacements are to be taken as a matter of course.* It

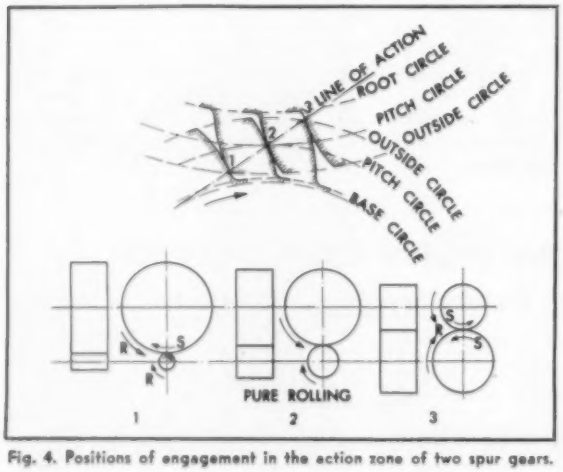

Fig. 4. Positions of engagement in the action zone of two spur gears.

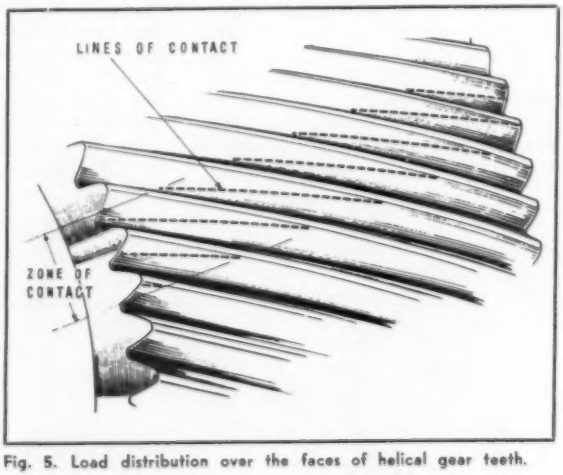

Fig. 5. Load distribution over the faces of helical gear teeth.

Fig. 8. Spur gear tooth in approach arc (left) takes full load and maximum stress.

behooves the prospective purchaser of any geared equipment to assure himself that all elements are designed according to the authoritative formulas of the accepted, responsible gear engineering body. These matters are subject to simple precautionary checks.

Nature of Spur Gear Action

Disturbances in the transmitted motion may be experienced with new as well as with worn gearing. Figure 6 illustrates, in the left-hand view, a gear tooth whose profile lies outside (proud) of the mathematically correct involute outline. The right hand view shows the mating pair of such teeth in a series of positions of engagement as they progress through the zone of action. At the extremeties of engagement, premature and delayed contact are encountered, as shown by the dotted profiles. Irregularities in the transmitted motion are a necessary consequence thereof. This is plotted diagramatically in the velocity curve in the upper portion of the illustration. It is to be noted that in the arc of approach there is an acceleration, at the beginning of contact, then a modest change in velocity as action proceeds through points 3 and 4, followed by a sharp deceleration until, in the region of pitch line contact (5), uniform velocity is re-established. A similar distortion of motion is experienced in the arc of recess.

Such a disturbance would prevail irrespective of whether the gear is spur or helical if the tooth outline is proud of the theoretical involute curvature. However, in helical gearing the tooth can be shaded so that it is inside the theoretical involute a minute amount, thus leaving the uniformity of motion to be maintained by the helical trace. It is not practical to so modify spur tooth forms because that would lead to a velocity disturbance of a character similar to that experienced with the proud profile. *This explains why spur gearing may never be lapped with a grinding medium such as is frequently employed in the processing of helical gear sets. Under such action, the spurs will lap out of the conjugate forms* essential to the uniform transmission of power, *whereas the helicals lap into an intimate condition of contact* without adverse influence upon the velocity rate. *A similar result proceeds from field wear when the gears operate in an abrasive atmosphere,* or where borderline lubrication prevails.

In the upper view of Figure 4, contacting spur teeth are shown at three positions of engagement in the zone of action. Below this are illustrated cylinders representative of the instantaneous curvatures that prevail at the initial engagement (1), at the pitch line (2), and at the termination of contact (3). The contact stresses would be expected to reach a maximum at position one, because of the high curvature of the smaller cylinder (if a single pair of teeth would have to carry the load). If the tooth spacing is accurate—

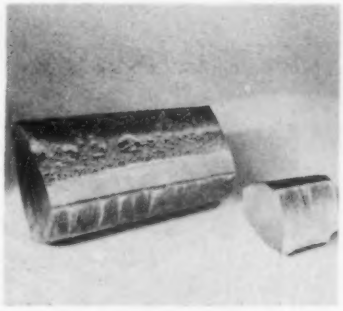

Fig. 9. Pitting of contact surface on broken spur tooth.

i.e., of a higher order than the elastic deflections of the gears under load—then the critical curvatures will be determined by that point at which one tooth begins to assume the burden of sustaining the complete load.

Figure 8 illustrates, three-dimensionally, the contact zone of a spur gear set at the instant when the load is being released by the departing tooth in the arc of recess (on the right) and when the tooth in the arc of approach (on the left) is being subjected to the total load. Stress on the tooth surface is the maximum at that point.

Nature of Helical Gear Action

In helical gearing, a series of teeth share the load continuously, assuming, of course, that the gears are accurately generated. Figure 5 shows how the loading is distributed. Contact on each tooth extends only partially over the face; the higher the helix angle, the shorter the individual contact, but the greater the number of teeth sustaining some portion of the total pressure. With low helix angles, the individual contacts are greater in length, but the number of teeth simultaneously in engagement is lower. However, the total

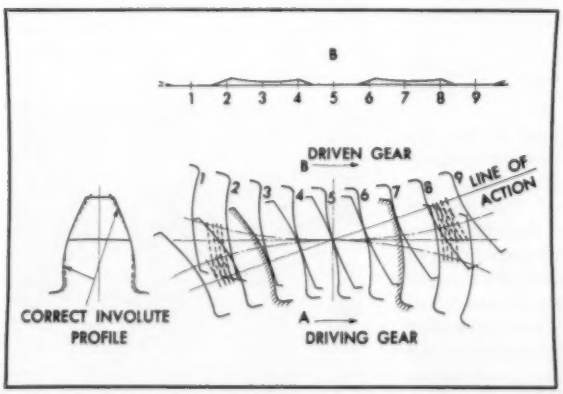

Fig. 6. On the right is drawn the premature and delayed contact of incorrect (new or worn) involute profiles.

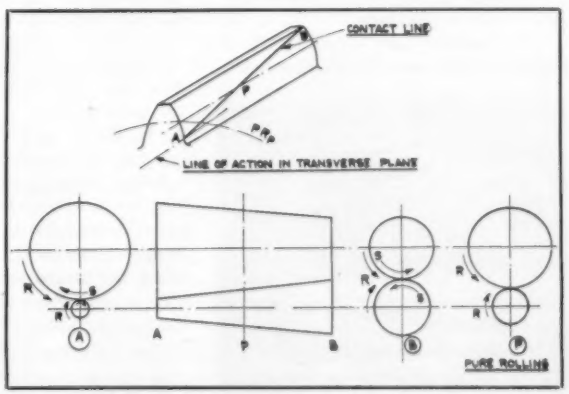

Fig. 7. Simultaneous pressure of all phases of tooth contact from approach to recess.

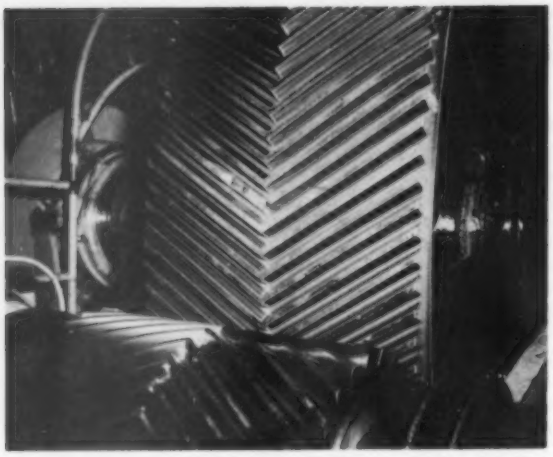

Fig. 10. Broken herringbone tooth caused by idler between two such gears. Idler could not accommodate to both.

contact length for the high helix angle is about a standoff with that of the low helix angle gear.

Perhaps the greatest advantage of helical gearing lies in the fact that all phases of contact are simultaneously present. Reference to Figure 7, upper view, reveals that the contact lies obliquely over the tooth surface, embracing every condition from approach contact to recess contact. Sliding is highest at points A and B; pure rolling prevails at P. Likewise, the contact line simultaneously embraces the regions of high curvature ratio, as well as those of low curvature ratio, where the profile is more rugged.

In helical gears we have the equivalent of truncated cones in pressure contact, as illustrated in the lower view of Figure 7. It is apparent that the high surface stresses that are developed in straight spur teeth at the inception of contact (A) are avoided in helical teeth, because the profile deformations essential to their existence cannot take place while the stronger (lower curvature ratio) portions of the tooth share the load.

Contact Stress and Surface Failure

The broken spur gear tooth of Figure 9 also manifests severe pitting of the contacting surface. There is a finality about tooth breakage that justifies the setting off of the "three-alarm crisis gong", especially when operations must be halted until a new gear can be manufactured. Progressive pitting and the attendant surface mutilation is, however, much more common, and in the aggregate, more costly. Many more mill pinions have been replaced because of wear than because of breakage. The latter is rarely encountered in helical gear operation, because an excess of tooth strength is obtained by virtue of the fact that several teeth are always sharing the load.

Pitting first develops in the region just below the pitch line, where sliding approaches zero and, possibly, where the lubricating film loses effectiveness. In spur gears this is close to the inception of single-tooth contact, the point at which the contact stress is the maximum. Pitch line pitting is a matter of particular concern in spurs, especially when the entire load will have to be sustained momentarily in that area with whatever loss of bearing the pitted voids produce. The phenomenon becomes accumulative, as the decreased contact has less material to carry the imposed load; this leads to higher unit loading, with subsequent further loss of surface area.

In helical gearing, pitch line pitting is distinguished from progressive pitting and generally is only corrective and incidental. The load is always sustained, as has been explained, by both the more rugged and the more sensitive portions of the profile. Even if the critical region is sharply reduced by pitting, helical gears still function properly because the line of contact does not lie parallel to this region.

The matter of rating in either spur or helicals is now seen to be a problem of evaluating the total length of the line of contact, the width of the mutual contact, the velocity and vulnerability factors, and of equating these to the specific normal load that will maintain the contact stress within the endurance strength of the material.

Double Helical Mill Gears

In the past, many thousands of herringbone gears have been fitted to mills and, in the main, have given a good account of themselves. The primary consideration in the application of herringbones involves respect for the principle that the element of lower mass (the pinion) be unrestrained axially so that the essential equality of loading of the two helices can be developed at all times. Every herringbone gear has some axial runout of the apex, one cycle per revolution, regardless of the process by which it has been cut. For gears produced by pinion-shaped cutters, there is superimposed upon that runout another determined by the relation of the number of teeth in the cutting tooth to the number of teeth in the gear. The pinion must be free to follow this axial movement of the gear apex during rotation. Let us see what happens when the necessary axial freedom of one of the engaging elements is not provided.

The broken tooth in the continuous tooth herringbone gear of Figure 10 followed as the result of interposing an idler between the two drum gears of a conical dual hoist, in which the power of the two motors is supplemented by the energy of the descending hoist load. The idler, as might have been expected, could not simultaneously accommodate itself to the vagaries of the separate runout patterns of the two hoist gears, with the consequential imposition of indeterminately high tooth loadings. Failures began at the apex, where high stress concentration exists, and eventually,

(Continued on page 102)

Fig. 11. Single-helical gears replacing misapplied herringbone.

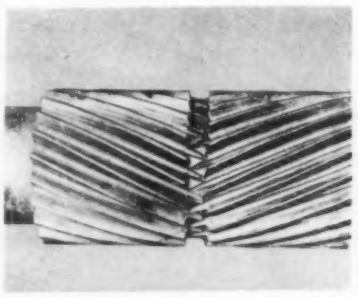

Fig. 12. Helix mutilation caused by axial flutter of pinion.

Report on Current Labor Developments

By S. HERBERT UNTERBERGER
S. Herbert Unterberger and Company
Industrial and Labor Economist
Washington, D. C. - Philadelphia, Pa.

Strike-Prone States

A RECENT study made by the Bureau of Labor Statistics measures strike activity on a state-by-state basis for the three years 1952, 1953, and 1954. The measure used is the "idleness of workers involved in work stoppages as a percent of estimated working time of all workers." This takes into account both the number of workers on strike and the duration of the stoppage in relation to the total number of man-days in the year. A little further analysis of these statistics provides some very interesting results on the states with the best and worst strike records.

Which states had the worst record in these years? To determine this, the ten states with the highest percentage of strike idleness each year were selected.

The same states did not show up at the top of the list each year, but: (1) Three states were in the top 10, in terms of strike activity, in each of the three years. They were: Ohio, Pennsylvania, and Utah. (2) Six states were in the top 10, in terms of strike activity, in two of the three years. They were: Alabama, Indiana, Michigan, Missouri, Washington, and West Virginia.

Which states had the best record in these years? To determine this, the contrary procedure was followed. The 10 states with the *lowest* percent of idleness each year were selected.

The same states did not show up at the bottom of the list each year, but: (1) Three states were in the bottom 10, in terms of strike activity, in each of these years. They were: District of Columbia, North Dakota, and South Dakota. (2) Nine states were in the bottom 10, in terms of strike activity, in two of the three years. They were: Florida, Georgia, Idaho, Maine, Mississippi, North Carolina, New Hampshire, South Carolina, and Virginia.

The states with heavy strike tolls conform to no particular pattern. They are found in the North, South, East, and West. They are not necessarily the states with the highest industrial concentration.

The relatively strike-free states are clearly those with the least industrial concentration. Many of them are in the South or upper New England.

Absence-Prone Employees

Although absenteeism is a serious and costly problem in American industry, there has been relatively little scientific study of it. An important recent contribution to the field was made in a study of the situation at the New York Telephone Company.

That study came up with the following rather startling figures: (1) The best 33 percent of the employees accounted for virtually no absences; (2) The next best 33 percent of the employees accounted for 24 percent of the absences; (3) The next best 23 percent of the employees accounted for 32 percent of the absences; and (4) The worst 10 percent of the employees accounted for 44 percent of the absences.

The worst 10 percent stands out most clearly. This phenomenon whereby most of the absences are concentrated among a small group of workers has been found in other studies as well. Further study of the characteristics of that group is almost sure to be worth while.

Before turning to that study, the New York Telephone Company analysis made two very cogent observations from their findings:

(1) A study of sickness absences from 1923 through 1953 showed a high correlation between absences and business conditions. In their words, "We had a depression in the 1930's, hitting a low point in 1932 and 1933, and the absence curve also hit a low level at that time. The years 1942-45 were the war years, years of full employment, and also years of high absence. In the years since the war, with high employment, absence has remained at a high level but has declined from the 1945 peak. This gradual increase in absenteeism has come at a time when the overall health of our people has been improving remarkably."

(2) The rate of sickness absence in every year since 1939 was almost twice as high for women as for men. In 1953, the women were losing an average of 12.1 working days and the men an average of only 6.6 working days.

Finally they made a study of the most absence-prone employees — women found in the worst 10 percent. An especially important finding from the standpoint of labor force management was that the group with the highest absence in the first year of employment had the highest average absence throughout its entire period of service.

While some of the high-absence record is related to a greater susceptibility to infection, the research found that of far greater importance were the reactions and behavior of the individuals. A large proportion of the absences of the high absence women were caused primarily by attacks of nervousness, tension, anxiety, and hysteria.

The degree of absence was found to be related to personality characteristics. The average high-absence employee was found to be unhappy, discontented, and resentful. The average low-absence employee was found to be a happy and contented person.

The moral of the research is clearly that if you want a low-absentee record among your employees, hire happy people and keep them happy.

Electro Refractories to Buy Into Spar-Mica Corporation

A new mining and processing project for marketing of feldspar, mica, and other minerals is planned by Spar-Mica Corporation Ltd., of Montreal for two lower St. Lawrence River areas. Spar-Mica is a joint undertaking by Electro Refractories and Abrasives Corporation, and Strategic Materials Corporation.

The properties involved are stated to contain pegmatite deposits of great size and are both located on the north shore of the river—one being near Tadoussac and the other east of Havre St. Pierre.

Spar-Mica is now a sub-subsidiary of Strategic, and Electro proposes to acquire an equal interest in it. Management will be provided by Electro.

"The company will have the exclusive advantage of a new and unique feldspar processing method developed by Grant S. Diamond, who has been president of Spar-Mica for the past two years, as well as being president of Electro," said an official. "This process is believed to yield 50 percent more glass spar concentrate than present upgrading methods."

Helical Gearing

(*From page* 100)

complete sections of the rim broke out. The re-engineered replacement single-helical gears appear as in the photograph of Figure 11, highly polished and totally without evidence of any distress after several years of service.

Although experience with herringbone mill drives in the main had been acceptable, there were certain occasional installations where it did not function as intended. Strangely enough, the bad actors were not predictable. Figure 12 illustrates a herringbone mill pinion in which one helix is badly mutilated, whereas the other is in fairly good condition. Observation and analysis indicated that the difficulty arose from axial flutter during reactionary load impulses, as described previously.

As a natural consequence of such occasional erratic behavior, and because of the desire to eliminate pinion replacements, the herringbone mill drive was largely abandoned, and new designs involving single helical were adopted.

Advantages of Single Helical Mill Gears

To summarize, the following improvements can be claimed for the single-helical over spur gears, applied to mills or kilns:

1. An increase in physical contact length of approximately 35 percent for gears of like proportions. This is reflected in increased surface durability.
2. Lower dynamic loading arising from the improved character of engagement. This is reflected in increased capacity and lower sound levels.
3. An increase in strength arising from the fact that the minimum of two teeth continuously share the load in helicals, as contrasted to single-tooth loading in spurs.
4. An increase in strength arising from the oblique nature of load distribution on each helical tooth in the zone of action.
5. A higher pressure angle is practical in helical gears than is possible with spurs because the continuity of motion is not dependent on the transverse contact ratio.
6. Higher ratios are practical in helical gear trains; this leads to more economical prime movers, increased efficiency, and reduced floor space.
7. The helical tooth contour can be produced with greater facility because deviations inside the theoretical involute do not lead to disturbances in tooth action. Continuity of motion in helicals is determined by the helical trace and is not entirely dependent upon the perfection of the involute profile, as are spurs.
8. Helical gears maintain correct conjugate action. When spur gear profiles wear, they produce profile variations that lead to increased disturbances. Spurs tend to wear out; helicals tend to wear in. Unlike herringbone gears, a single helical pinion can be reversed without moving the gear.
9. Helical gears are a little less sensitive to malalignment since their self-corrective property (with ductile materials) permits the teeth to wear in to the imposed constriction.
10. Lubrication is more complete, and entrapped abrasive or foreign material in the lubricant is disposed of by the skewing engagement of helicals.

The above are primary advantages in the use of modern helical gearing for mills and kilns. Experience has demonstrated that there are also secondary benefits, such as increased bearing life, lower shaft stresses, avoidance of bolting failures in the mounting ring flanges, less motor upkeep and better coupling life.

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CENTRIFUGAL SWITCH which automatically shuts off the motor when the belt becomes jammed and starts slipping on the drive pulley, is available from the *Ensign Electric & Mfg. Company*. It prevents fires from starting due to slippage on the pulley and saves replacement cost of expensive belts. Tonnage loss is lowered by reducing extended belt shutdown. **(1)**

VERTICAL AUGER DRILL for heavy duty is available from *The Salem Tool Co.* The drill has a high-speed power take-off—one speed for rock, and one speed for other earth formations. Outside power take-off is provided for large augers at one-half speed. It is equipped with a hydraulically-operated throttle valve. Equipped with a 60-hp. gasoline engine, it can also be supplied with diesel or electric units at extra cost. **(2)**

FLEXIBLE HOSE LINES with detachable, reusable fittings are offered by *Aeroquip Corporation*. They are said to reduce inventory, cut operating costs, reduce downtime, and be easy to assemble. Hose and fittings are quickly and easily hand-assembled without special tools. **(3)**

TORQUE CONVERTERS which multiply torque and transmit power in the horsepower ranges from 15 to 600 are available from the *Clark Equipment Company*. A built-in cooling system consisting of air to oil radiator with direct driven fan provides excellent efficiency. Complete accessibility to all auxiliary components on the inside is assured by ample sized inspection plates. Other accessories such as regulating valves, are mounted on the outside of the housing for immediate inspection. **(4)**

EXCAVATOR and angling bulldozer for mounting on the International 300 utility tractor is available from *Pippin Construction Equipment, Inc.* It digs to a depth of over 10 ft. and loads trucks to a height of 9 ft. with back hoe bucket and 12 ft. with shovel bucket. The front drive pump can be used for operation of both the excavator and front end attachments. **(5)**

ELECTRIC POWER is provided in a reliable form by the new *Caterpillar* diesel electric sets. They feature: matching to engine performance; self-regulation, with close voltage regulation; easy installation; full adjustments for special conditions; and small and compact size. The sets are easily paralleled with other generators now in use. **(6)**

RING GEAR performance is the subject of this report put out by *The Falk Corp.* It compares the design and operating characteristics of the various types of ring gears which have been employed to drive kilns and mills, and indicates the performance which may be expected. **(7)**

CRAWLER TRACTOR Model HD-16 made by the *Allis-Chalmers Mfg. Co.* is described in this booklet. It boasts horsepower of 150 net engine with torque converter drive and 131 belt with standard transmission drive. Engine safeguards include an easily accessible and replaceable filter system, full-pressure oil pump and deep sump that delivers oil to engine parts at any angle—uphill, down hill, or sidehill; and a temperature regulator that heats oil for quick engine warm-up, and cools it when the engine reaches proper operating temperature. **(8)**

NEW AUTOMATIC GREASE MONKEY is the name of this bulletin offered by the *Reliance Electric & Engineering Co.* It describes the ingenious Metermatic pre-lubricated bearing design which is used on the company's a.-c. and d.-c. motors. The design features a metering plate that automatically regulates grease flow to the bearing and provides pressure relief against over-greasing. **(9)**

A DRY FLUID DRIVE called Flexidyne is a new product made by the *Dodge Mfg. Corp.* This bulletin gives complete descriptive, technical, and ordering information regarding this new drive which constitutes a new approach to the old problem of power transmission. **(10)**

SCREENING, using machinery made by the *Productive Equipment Corp.*, reduces "near size" blinding with the firm's patented "L & L" cleaner. With this cleaner system flexible ropes are supported beneath the screen cloth and constantly tap the entire surface of the screen cloth to knock out any particles starting to blind. This brochure lists their full line of screening equipment. **(11)**

AUDIO SAFETY SYSTEM. An interplant or mine communications system made by the *Mine Safety Appliances Company* can be used to transmit repeated safety reports, instructions, announcements, and all other informations which must be disseminated with speed and accuracy. **(12)**

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marketed by the *Lord Mfg. Co.* They provide a high degree of vibration and noise isolation, particularly in the low-frequency, high-amplitude range. (13)

ROPE-OLOGY is the title of this bulletin published by the *MacWhyte Company* which contains interesting articles on new combination cable-tool and rotary well drilling machines, helicopter hoisting, and the firm's new plastic-coated cable. (14)

REVERSING TRANSMISSION for use on Ford tractors has been introduced by *Sherman Products, Inc.* The new unit is said to add convenience and speed in operations where reverse speed is as important as forward speed. Five forward and five reverse speeds enable fast shuttle operation. (15)

ORE FEEDERS of many types and models are described in this catalog offered by the *Denver Equipment Co.* Complete specifications and descriptions of the company's adjustable stroke, plunger, and various apron-type ore feeders are included. (16)

WELD RODS of tungsten carbide for hardsurfacing work made by *Coast Metals, Inc.*, are listed in this leaflet. Mesh sizes from 5 to 40, and several application method types are available. Manual rods are all 14 in. long and come bare for acetylene welding, and coated for arc welding. (17)

EMERGENCY LIGHTING equipment is listed in this catalog of the *Exide Industrial Div. of The Electric Storage Battery Co.* These Exide Lightguards are the first emergency lighting units to receive approval by Underwriters' Laboratories, Inc. Models designed for permanent connection, auxiliary lighting equipment, and a transparent plastic-cased battery make up the line. (18)

CRAWLER TRACTOR with a narrow over-all width (less than 42 in.), or wide gauge (up to 68 in.) versatility is offered by *The Oliver Corporation* in their new Model OC-3. It provides almost a full 22 drawbar hp. rating and Oliver Differential Steering gives complete control of the unit at all times with little effort or strain. (19)

PYROMETERS manufactured by the *Barber-Colman Company* are listed in this new bulletin. These instruments are available in two styles in ranges up to 3600 deg. F. Instrument scales are mirrored to avoid parallax errors. A combination indicating pyrometer and multi-position switch is also described. (20)

PAN-TYPE CONVEYORS, both balanced and conventional, are the subject of this leaflet from the *Simplicity Engineering Co.* Positive action of the firm's conveyors is assured by a constant speed roller bearing eccentric and single or double heavy-duty drive arms. The single sheet pan construction of the units makes them easy to clean and ideal for handling abrasive materials. (21)

TRACTOR-SHOVELS featuring an extra heavy-duty power train including power-shift transmission, torque converter and 4-wheel drive planetary axles have been introduced by the *Pettibone Mulliken Corp.* The line comes in 1¼, 1¾, and 2½ cu. yd. models. (22)

GRADER with a 195-hp. motor has been announced by the *Huber-Warco Company.* The brochure illustrates the machine's completely cab-controlled 90-degree blade movement together with a discussion of the unit's saddle which makes it possible. (23)

DUMP BODIES of heavy-duty construction which are manufactured by *The Heil Co.* are in this pamphlet. The bodies feature an interlaced underbody construction for minimum body distortion and floor sag, single steel sheet body sides, and one-piece corner posts. (24)

POOL WASHING SCREENS for handling limestone, sand, phosphates, etc., are listed in this bulletin by the *Allis-Chalmers Mfg. Co.* It explains how the screen provides efficient wet screening and effective media recovery while conserving water, increasing screening capacity, minimizing blinding, and promoting long screen surface life. (25)

CEMENT USES and manufacture are discussed in this booklet put out by the *Medusa Portland Cement Co.* It takes the reader on a trip through the quarrying, crushing, grinding, blending, burning, cooling, and other stages of cement making, and lists the varied uses of Portland cement. (26)

SPEED VARIATORS are now being made by the *Cleveland Worm & Gear Co.* The firm's line of Type K drives in 9 standard sizes with constant horsepower input ratings has now been supplemented by the addition of 9 Type KL models for constant torque applications. (27)

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Consider Tax Angles in Making

Management Decisions

By HAROLD J. ASHE

FOR more than a decade the United States has had a federal tax law which reaches down to the lowest levels of individual income for revenue even while assessing high corporation rates. At the same time a large segment of management has failed to catch up with this elementary fact of business life in the second half of the twentieth century.

Whether a non-metallic minerals producer is operating his business as a corporate or non-corporate venture, one thing is certain: ownership is taxed at least once, if not twice, on business earnings. If non-corporate, owners pay an individual income tax on all net earnings above personal exemptions and deductions, whether earnings are distributed or not. If the business is incorporated, stockholders pay (a) on corporate earnings and (b) on distributed earnings in the form of dividends. In either case, the rates are likely to be exceedingly high.

Yet many operators continue to conduct their affairs without giving serious consideration to the impact of individual or corporate taxation. Decisions are based on partial knowledge, instead of all the facts.

While traditional management attitudes and policies which are sound are still warranted, these need more and more to be qualified and modified in the light of the heavy tax burden hanging over a business and its owners, whether sole proprietors, partners, or stockholders. It cannot be emphasized too strongly nor too often that every corporation having net earnings and every non-corporation owner, above his exemptions and deductions, has a silent partner in his business—Uncle Sam. Silent though he is, this partner is exacting.

The government establishes and enforces the ground rules of this partnership. However, depending upon the active partner's vigilance or indifference to taxation—and within the framework of these rules and regulations—a corporate or individual taxpayer's bill may be sharply increased or materially reduced.

Thus, while every effort should continue to be exerted to eliminate waste and reduce inefficiency, some "economies" which are practiced may have dubious value, considering *income taxation.*

An "economy" which, prior to World War II, might have considerable merit may have less justification now after its income tax result is equated by management. The saving—if a real saving in fact results—may be substantially less than tax-indifferent management has reckoned. We do not propose that *bona fide* economies are not justified, as such. Rather, it is suggested that the tax factor be weighed against other considerations upon which a final decision is made. If the *pros* and *cons* for a proposed economy are about evenly weighted, the decision may go against the economy when the tax element is tossed into the scales.

A good many economy devices and savings gimmicks which are instituted are predicated on no further calculations than an understandable but fallacious desire to fatten net earnings. These measures often have contrary results. By whatever name, and for whatever plausible excuse, this is simply the old device of "milking" a business. This practice amounts to starving the business and forcing its deterioration and eventual closing, if the trend is not reversed in time.

Oddly, management may ignore genuine savings which can be made without adversely affecting the business and at the same time practice "economies" which are actually injurious. What are some of the economies which income taxation, as well as sound management, should frown upon? Here are only a few:

Make-do—Considered a management virtue during World War II and times of scarce supplies, this philosophy has carried over to the present. Getting along with obsolete plants, equipment, machinery, and other items can never be justified at any time. The cost, as reflected in inefficiency, waste, loss of productivity, idle time, is incalculable. While a policy of make-do may seem to be justified on the basis of low net earnings, it ignores the fact that low earnings may be the *result* —and not the cause—of such a management practice. Once well embarked on such a course, a manufacturer or contractor may find it increasingly difficult, if not impossible, to reverse his direction.

Bailing-wire trucks — Antiquated trucks cannot be justified, management-wise. Although costly repairs are tax deductible, this charge reflects only a small part of the total cost. Deliveries are delayed to customers, often with the loss of good will. In the case of contractors, a crew may be idled by a truck breakdown. Meantime, the payroll goes on although work has come to a stop. Temporary loss of even one truck can throw work schedules out of kilter and reduce the job profit to a negligible figure—if, in fact, any profit remains. Late model trucks will more than pay for themselves. Depreciation write-offs will reduce the tax and increase efficiency.

Cheap help—Hiring cheap office workers solely to cut expenses and with the thought that the employer's earnings will be enhanced is folly. By "cheap" we mean below the prevailing salary for the particular skills. The same is true in the sales department. Lost sales, bookkeeping errors, and leaks due to inefficient, "cheap" employees will more than offset any theoretical saving. Here again, the "saving" contemplated is less, if income taxation is taken into consideration. A "bargain" employee working for $300 a year less than an efficient, productive one will represent, even on paper, a saving of only $144 for a corporate employer having a 52 percent corporation tax. For a non-corporate employer in the 43 percent individual income tax bracket, the saving is only $171. Therefore, if income taxation is considered,

there is even less excuse for settling for make-do salaried employees.

Reducing advertising budgets — Advertising budgets often are cut sharply in the mistaken belief that greater net earnings will result from the saving. Yet, the only kind of advertising which can be safely reduced is that which has proved unproductive. To cut productive advertising is a surefire way to cut volume and to reduce net earnings even more sharply. If advertising is more than paying it own way in results—and it should—it would be as foolish to cut such advertising as to lay off a profit-producing salesman or another valued employee.

Here, too, income taxation picks up a part of the tab. As a legitimate cost of doing business, a $5,000 advertising budget is a business expense which will reduce the corporate tax bill by $2,600. For the non-corporate manufacturer or contractor it will reduce his individual income tax bill by the brackets in which, otherwise, such an amount would appear as net earnings in his tax return. Actually, of course—and this needs emphasizing—advertising outlay is one of the factors which put the taxpayer (corporate or non-corporate) in a higher earning bracket. Reduce the advertising budget, and an economy-minded manufacturer or contractor very likely will nose-dive in his earnings. This is poor economy and even worse management, any way you look at it.

Economy measures that tend to depress net earnings—although made in the hope of enhancing profits—can never be justified on the grounds of good management. And with income taxation now a major consideration, there is even less excuse for dubious economy measures.

Producers who have learned to think carefully and consistently about the tax consequences of each management act of omission (or commission) can not only enhance net earnings but often reduce their income tax bill as well. At the same time they are upgrading their business and keeping it on a solid foundation by preventing obsolescence and decay. In this program, they are obliging the government to help defray the cost of its tax-partnership through lower tax assessments.

Roy Wilson and his son Doyle, of Macksville, Kans., have purchased a sand plant south of Dillwyn, Kans., which was formerly owned by R. R. Rush and James Tillery.

Note Changes in Ownership Of Sand and Gravel Firms

Among the recent changes in ownership of sand and gravel companies is the purchase of the Portland Sand and Gravel Company, Parkrose, Oreg., by Ralph E. Griffin from William Craswell and Mrs. Rosa M. Craswell. Also in Parkrose, the Troutdale Sand & Gravel Company was sold by Richard Knarr to Alfred R. Frey and Dallas W. Brown for approximately $90,000 to $100,000. Production capacity at the plant is 200 yd. of sand and gravel daily, and 100 yd. of concrete daily at the batching plant.

In Auburn, Wash., the Valley Sand & Gravel Company was recently sold by Joe Harwood and Ken Nystrom to William Byrns, who expects to make some improvements in plant and equipment and expand. The firm presently employs seven men, and uses four mixer trucks, three dump trucks, and two loaders.

Sale of the Grover C. Hubbell sand and gravel interests and the Crown Concrete Company located in Des Moines, Iowa, to the Hallett Construction Company, Crosby, Minn., has been announced. The sand and gravel holdings include The Coon Valley Gravel Company.

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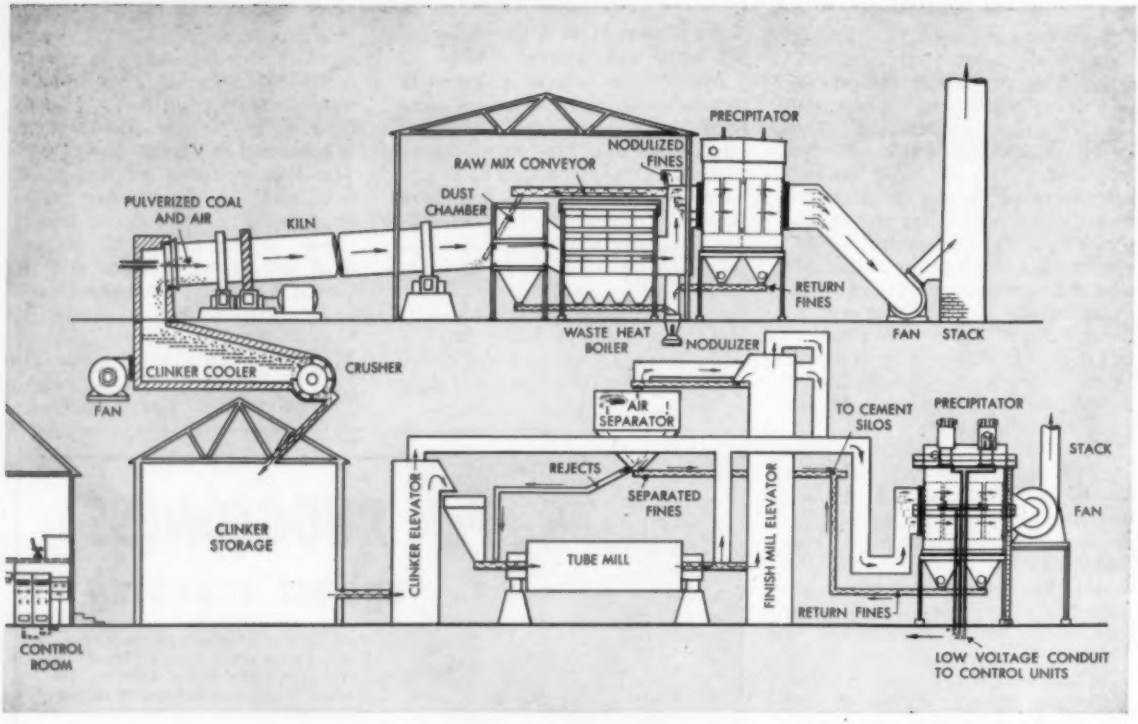

How dust collecting problems are handled in the modern cement plant

The "why" of the Cottrell precipitator is well known to cement plant personnel—its use in nuisance abatement and cement dust salvage is well established. These diagrams explain the "how" of the Cottrell, including its familiar application to kiln gas and, more recently, its use in the ventilating system of the finishing mill.

Kiln Gas

The upper half of the drawing shows a Cottrell for cleaning kiln gases. They are first passed through a dust chamber to the waste heat boiler and from there to the electrical precipitator, where the dust is removed. Salvaged dust is returned by conveyor to the process. The cleaned gas is discharged to the atmosphere through an induced draft fan and the stack. (Wet process kilns may also be fitted with Cottrells).

And In The Finish Mill

Dust from the grinding mills has always been a major problem. The lower half of the diagram shows the recent application of the Cottrell for cleaning finish mill ventilating system gases. Cement dust is collected from the ventilating system serving the separators, conveyors and elevators. As before, recovered dust is returned to the process.

Separating Small From Large Particles

When large particles of low alkali content must be separated from very small particles of high alkali content, an integrated mechanical-electrical precipitator will do the job effectively. The mechanical element handles large particles, and the electrical element collects the smaller particles that escape it.

Rapping Puffs Eliminated

With Research-Cottrell's electronically controlled Magnetic Impulse Rappers, there is no need for rapping shutdown periods or dampers. Automatically controlled and operated, the MI Rappers continuously rap the electrodes throughout precipitator operation, thus avoiding dust re-entrainment in the gas stream and assuring optimum precipitator performance at all times.

Many Design Advances

The MI Rapper is one example of many improvements that have taken place in the design of precipitators and their associated electrical equipment. Forty years of experience have provided Research-Cottrell with a rich store of engineering skill—it is this skill that has evolved the modern Cottrell precipitator, embodying a design based on knowledge gained through more than 2000 precipitators in many different fields. Fourteen of these have been installed or are under construction for cement plants. All of these precipitators were custom-engineered to individual specifications.

For a more complete description of the Cottrell precipitator, write to Research-Cottrell for Bulletin GB.

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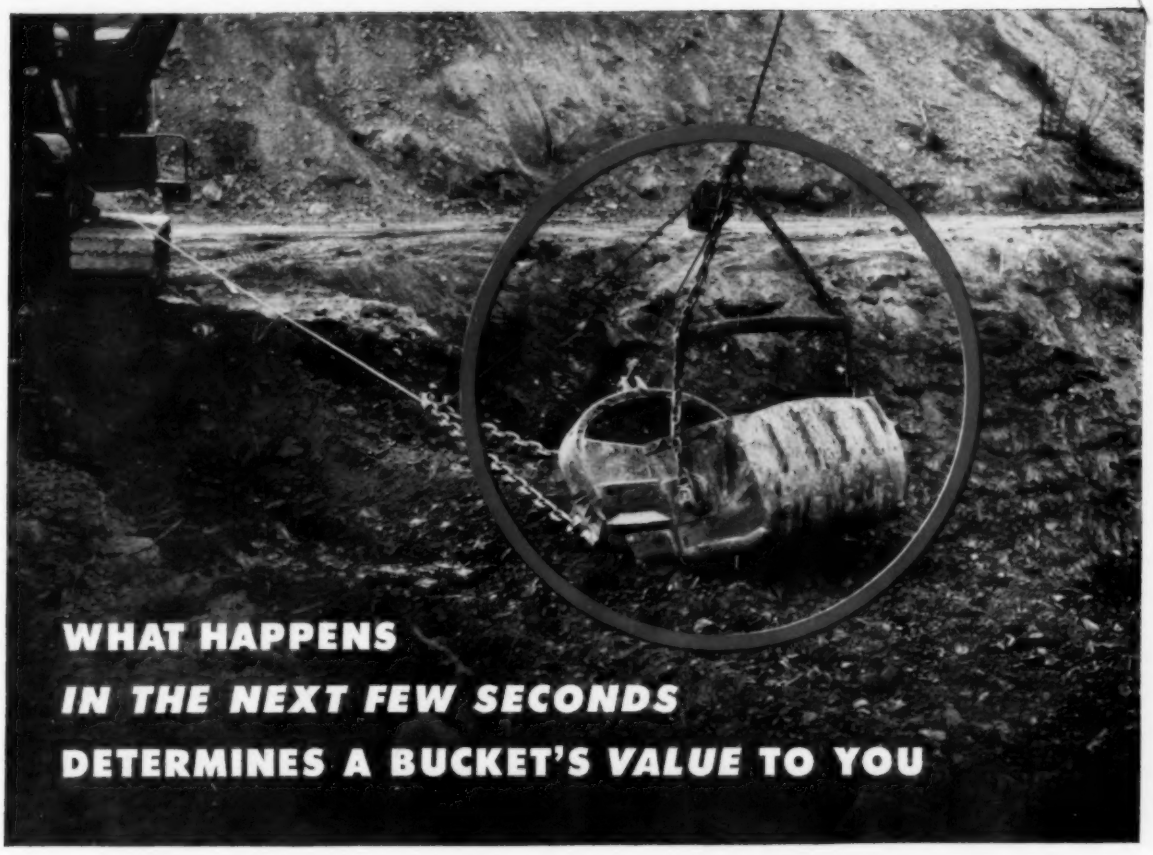

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Hand picking, scrubber, blade mills, screw classifiers, and liquid cyclones do a job in

S. Carolina Gravel Plant Designed to Remove Clay And Save Fine Sand

another ON THE SPOT report

THE Becker County Sand & Gravel Company, long a leading producer of sand and gravel and crushed stone in Minnesota and Iowa, with main offices at Crosby, Minn., in a comparatively few years

By WALTER E. TRAUFFER

has also become one of the largest producers of aggregates in the Southeast. It now has six sand and gravel plants in the Carolinas, all located within a 175-mile radius of the company's southeastern office at Cheraw, S. C. The largest of these plants and the one with which this article is chiefly concerned, went into operation in March, 1954, at Marlboro, S. C., 15 miles south of Cheraw. Other plants are located at Fayetteville, N. C., 75 miles northeast of Cheraw; Camden, S. C., 75 miles southwest; Marion, N. C., 160 miles west; and the newest one, just completed late in 1954, at Lillington, N. C., 100 miles north of Cheraw. Another plant at Kathwood, S. C., is operated under the name of Carolina Aggregates, Inc. Together these plants produced over 3,000,000 tons of aggregates in 1954.

In its 15 years of operation in the South the company has encountered and overcome a number of problems. One of these is clay, which is found in most of its deposits, including the one at Marlboro. The complete provisions for the removal of clay at this new plant are the result of the experience gained by the company's operating staff at the other plants. Removal of this clay begins at the primary hopper, where dry and wet loads are alternated as far as possible. Large clay lumps are hand-picked from the primary conveyor. Hand picking is done between the rotary scrubber-screen and the two blade mills and at the vibrating screens following the mills.

The sand recovery system is designed to remove any remaining fine clay, as well as to provide accurate gradation of the sand. This system is also based on experience at the company's other plants. The large volume of water required to insure removal of clay complicates the classification problem, since much of the fine sand flows off with the clay. The problem has been to retain the minus 50- and 100-mesh sand while discarding the minus-200-mesh material which is mostly clay. It was found that 1,000 g.p.m. of water is required for each 100 tons of raw material per hour fed into the plant in order to thin down the material enough so that the clay and sand will separate.

Various combinations of equipment and methods were tried at different plants before the present combination was arrived at. The first 25-in. dia. cone classifier was tried in 1950, and this type is now used in all plants to handle this problem. The present system includes dewatering screw classifiers, the overflow going to a large settling tank. Slurry pumps feed the material from the bottom of the tank to the cones. The minus 200-mesh slime overflow-

This view of the Becker County Sand and Gravel Company's plant at Marlboro, S. C., shows the arrangement of equipment over ground storage.

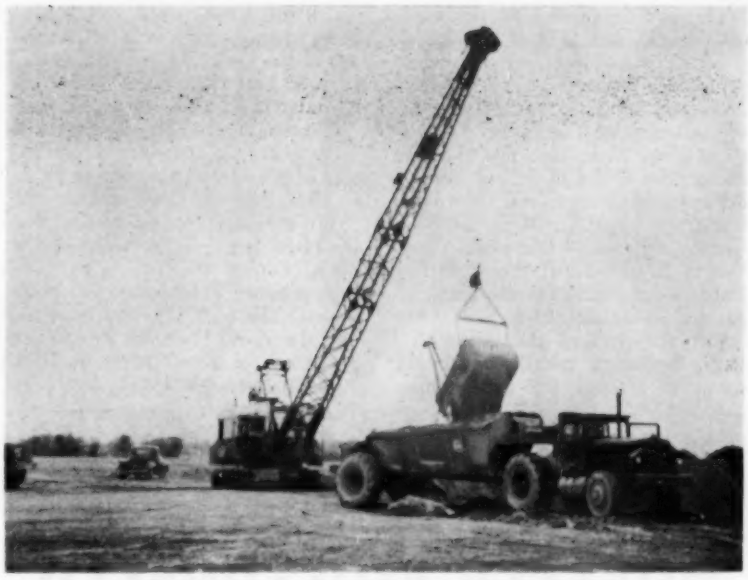
The station where clay balls are hand-picked from the main belt conveyor.

ing the cones contains most of the remaining clay.

The new Marlboro plant replaces the company's original plant in the Southeast (at Cheraw), which was built in 1941. Since the deposit at this plant was exhausted, it has now been dismantled. The deposit at Marlboro, like others in this area contains good material, 99 percent silica, but it has an excess of sand and considerable sticky red clay. It is a river bed deposit containing about 40 percent gravel and 50 percent sand, of which only part is needed. The gravel is small in size with very little over 3 in., and most of it is under 1 in. in size. The other 10 percent of material is plastic free clay which is difficult to remove. As a result the new plant, designed to process 600 t.p.h. of raw material, actually produces 250 tons of gravel and 100 tons of sand per hour. The sand output can be doubled if necessary. The company has 4,000 acres of this deposit under lease.

Before the decision to build this plant was made, the property was thoroughly prospected. An auger-type drill making a 24-in. dia. hole was used. This drill is made by the California Welding and Blacksmith Company of Los Angeles.

Overburden averages 12 ft. in depth and is removed at night by the same two draglines used for excavating the deposit—one a 2½-cu. yd. Lima with a Page bucket and a Waukesha Hesselman 200-hp. engine, and the other a 2¼-cu. yd. Lima with an Esco bucket and a D17 Caterpillar engine. Most of the 12 ft. average depth of the deposit is under the ground-water level. The water is kept pumped out so that excavating is done dry. Two pits are operated with hauls of about 1 mile each.



A 2½-cu. yd. dragline loading one of the company's fleet of ten 20-ton bottom-dump trucks.

Another view of the plant, showing the recirculating conveyors and two flumes (left) which carry waste and water to the ponds.

One of the two 8- by 13-ft. blade mill scrubbers which help eliminate clay.

The blade mills discharge to the three 5- by 12-ft. 3-deck screens in the foreground.

The two draglines load the sand and gravel into a fleet of ten Euclid 20-ton bottom-dump trucks, powered by 150-hp. Cummins diesel engines. These are equipped with Goodyear nylon cord tires. The present haul is about a mile from both pits to a 60-ton hopper at the plant with a slotted opening through which the bottom-dump trucks discharge. A 12-in. spacing rail grizzly keeps out oversize. A 30-in. by 7-ft. reciprocating plate feeder discharges the material on the 36-in. by 303-ft. belt conveyor. Sprays keep the tail pulley clear. A hopper part way up this conveyor is used for clay lumps, which are hand-picked and hauled away when the hopper is full. At the top of the plant the material is discharged into a wash box where jets of water hit the stream of material.

The material then flows into a 5- by 24-ft. rotary screen which consists of a 7-ft. scrubber section, a 5- by 16-ft. inner screening section with 13/16-in. openings, and an 8-ft. dia. by 14-ft. outer jacket with ⅛- by ¾-in. slotted openings. There are high-pressure water sprays inside the screen. The plus 13/16-in. material and the ⅛- to 13/16-in. gravel each go to one of a pair of 8- by 13-ft. Allis-Chalmers blade mill scrubbers. Water sprays in the scrubbers can also be used when needed.

The ¼- to ¾-in. gravel from one of the two scrubbers goes to a pair of 5- by 12-ft., 3-deck vibrating screens—one an Allis-Chalmers Ripl-Flo and the other a Simplicity. The three sizes produced—usually ⅛ to ⅜ in., ⅜ to ½ in., and ½ to ¾ in.—are discharged through chutes to storage. Both of these screens are equipped with sprays.

Plus ¾- to 4-in. gravel from the other blade mill goes to a 5- by 12-ft. Simplicity 3-deck screen. Any clay balls remaining are picked out at this point. The gravel products off the two bottom decks of this screen—3/16 to 1 in., and 1 to 2 in.—are discharged to storage. The 2- to 4-in. gravel over the top deck of this screen is chuted to a 4-ft. Symons short-head cone crusher set at 1-in. maximum opening. Some of this material can also go to a 3-ft. Symons standard cone crusher when necessary. Both crushers discharge their products on a 24-in. by 75-ft. belt conveyor to a transfer station from which another 24-in. by 75-ft. belt feeds this 100 percent crushed material on a 4- by 12-ft. Hewitt-Robins 3-deck screen. The plus 1-in. material off the top deck of this screen goes back to the crushers. The other two coarse sizes—¾- to 1-in., and ⅛- to ¾-in.—go to the same storage compartments as the same sizes of uncrushed gravel. The chutes for the ¾- and 1-in. sizes are equipped with rock ladders.

Sand through the ¼-in. bottom decks of the four sizing screens is flumed to an Eagle 36-in. by 25-ft. single-screw classifier which produces finished concrete sand. This also goes to storage.

Sand through the outer jacket of the revolving screen goes to three Eagle 36-in. by 25-ft. single-screw classifiers. These can be operated in series or in parallel. One screw is above the other two, which are side by side. The sand is discharged to the top screw, where fresh water is added; next it goes to one of the bottom screws, which makes coarse sand. The overflow of fine sand from the top screw goes to the third screw, which makes mortar or plaster sand. The fines from the crushed material screen are also discharged into the third screw. Each of the two products is chuted to storage. A blend of these two sizes can be stored separately as concrete sand, or any other desired gradation can be made.

Overflow from the two lower screws goes to a 5-ft. deep by 8-ft.

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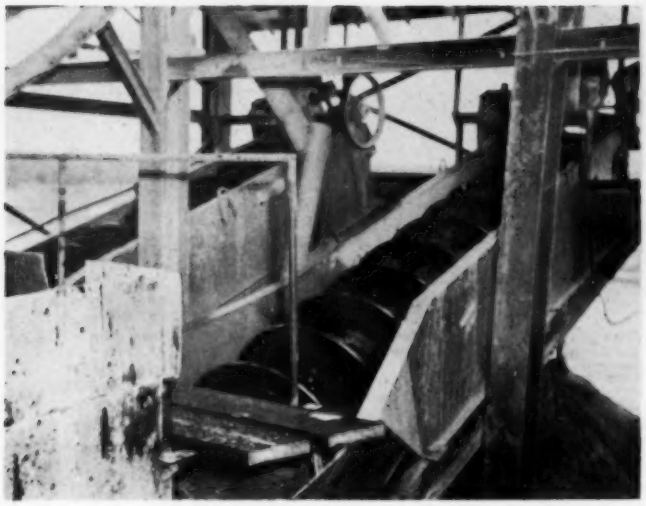
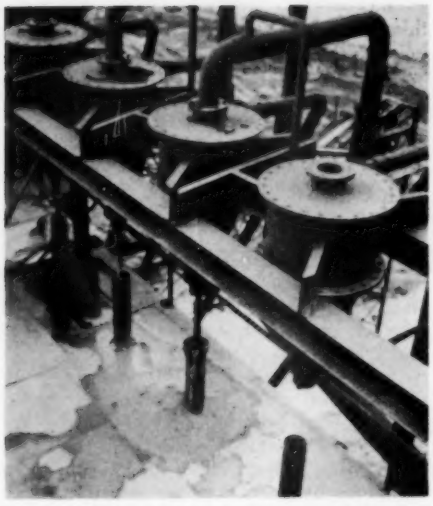


Two of the three crew classifiers which makes concrete and mortar sands.



The four 25-in. dia. liquid cyclones which reclaim fine sand from classifier overflow.

wide by 30-ft. long baffled settling tank from which four 4-in. Georgia Iron Works slurry pumps feed the settled sand to four 25-in. dia. Cottrell Whirlcones. These discharge into a common flume which in turn carries them into the above-mentioned mortar sand chute to storage. The fines, including clay, overflow the Whirlcones to a waste flume.

Excess water and sand from the rotary screen and the waste water from the Whirlcones go to a high wasteway flume. Water from the lower screws and the vibrating screens goes to another waste flume. The volume of the sand going to the screws can be adjusted as desired by valves and chutes. Excess goes to the high waste flume with the water.

At the top screw either fines or coarse can be wasted as desired. If ballast is being produced, fines would be wasted and the coarse sand fed to the two lower screws. If only fines are desired, the coarse sand is wasted from the top screw, and the overflow goes to one of the lower screws.

All tailings from the plant are flumed to a large swamp nearby. Retaining walls and an overflow weir make it possible to overflow clear water at the opposite end.

The concrete-walled ground storage on which the plant superstructure is mounted has six 2- to 5-car capacity compartments for the various sizes of gravel and two 7-car end compartments for sand. The 153-ft. long concrete reclaiming tunnel under the storage has four openings with radial gates under the sand compartment and two under each of the gravel compartments. Any desired blend of sizes can be made onto the 36-in. by 218-ft. reclaiming conveyor. A man in the tunnel adjusts these gates as indicated by light signals controlled from the loading point.

The tunnel conveyor discharges onto a 4- by 12-ft. Tyler Ty-Rock 2-deck rinsing screen equipped with high-pressure sprays. Sand by-passes the screen in a chute. A 36-in. by 130-ft. inclined belt conveyor at right angles to the plant carries this material to the car-loading tower. A Sintering Machinery Company Transportometer on this belt keeps a continuous weight record of all material loaded out. It also makes possible the loading of freight cars to capacity without overloading.

From the loading tower materials can be chuted directly to railroad cars on a track below for shipment, or to a portable stockpiler. A third choice is to discharge the gravel to another 36-in. by 100-ft. belt conveyor to two 4-compartment, 200-ton truck-loading bins. A revolving spout feeding to these bins is cable-controlled from ground level.

Left: The 4- by 12-ft. screen used for rinsing gravel before shipment.

Right: The 2-compartment 200-ton truck-loading bins with the revolving spout.

The portable stockpiler used at this plant is of an original design. Being rail mounted, it can be used only to stockpile materials adjacent to the extensive trackage. This method is ample for ordinary purposes and is also convenient, as most of the stockpiled material is later loaded into cars for shipment. Some direct truck loading is also done.

The stockpiler consists of a 40-ft. standard railroad flatcar with a 50-ton hopper mounted on one end. A 36-in. by 14-ft. feeder belt feeds the material on a 24-in. by 50-ft. stockpiling boom conveyor which can be swung in an arc of about 180 deg. to discharge on either side. A Vulcan 12-ton diesel locomotive spots the stockpiler under the loading tower to fill the hopper. The stockpiler then rolls by gravity to the desired unloading point. There stiff-legs are placed to brace the car as the boom is swung out for stockpiling. This unit has a capacity of 150 t.p.h. and requires two men to operate it.

Power for this equipment is supplied by a 30-kw. Caterpillar diesel-electric unit with a D4600 engine. The stockpiling conveyor is driven at its head end by a 10-hp. electric motor through V-belts and a speed reducer. The feeder belt is similarly driven by a 15-hp. motor. The boom is swung by cable from a drum driven from the head pulley of the feeder belt.

Reclaiming from stockpiles is done by a Model 6 Northwest crawler crane with a 2-cu. yd. bucket, a Link-Belt ½-cu. yd. crane, and an Osgood ½-cu. yd. truck crane. There is also an American car spotter, which, with the locomotive mentioned above, is used for moving cars. A Caterpillar motor grader is used for maintaining all roads.

The plant is on the Atlantic Coast Line Railroad, and most of the output is shipped by rail to the eastern seaboard as far away as Charleston, S. C., and Wilmington, N. C. Truck shipments are made for local demand, and Howe truck scales and surfaced roads are provided. All rail shipments are weighed on the railroad's scales. Much of the output goes into bituminous concrete and bituminous surface treatment roads.

Wash water for this plant comes from a creek *via* a 9,400-ft. long canal to a pond which is large enough to carry through any ordinary dry spell. Two 12-in. Fairbanks-Morse pumps operating in series pump 7,000 g.p.m. a distance of 2,500 ft. to the plant. Each pump is driven by a 350-hp. motor.

Electric power for all operations is purchased from the Carolina Power & Light Company at 2,300 v. This current is used for some of the larger motors and is reduced to 440 v. for the others.

The portable stockpiler which can, as is shown, also be used for directly loading trucks for shipment.

Goodyear conveyor belts and Continental Gin Company idlers and pulleys are used throughout the plant. Most of the motors are Allis-Chalmers.

The main office of the Becker County Sand & Gravel Co. is at Crosby, Minn. Officers are as follows: E. W. Hallett, president; E. A. Mullen, executive vice-president and general manager of southeastern operations; M. C. Evans, vice-president in charge of southeastern production; and M. W. Richards, secretary. W. E. Williams is assistant secretary and sales manager, and L. E. Gardner is engineer. Messrs. Mullen, Evans, Williams, and Gardner make their headquarters at the company's southeastern main office at Cheraw, S. C., where a new office building was recently erected. At the Marlboro plant T. J. McMillen is plant superintendent.

The plant was designed by Mr. Evans and Gardner in co-operation with other members of the organization. It is entirely of steel and concrete construction. One man in the control house at the top of the plant can see all operations and controls all the machinery. Bindicators in the storage compartments indicate levels by means of lights in the control house. An automatic sequence starting-and-stopping system insures against damage due to a breakdown of equipment. A telephone system connects the office and control room with the parts storage room and warehouse, truck loading bin, and inspectors' shed for utmost convenience.

New Clay Bulletin Published By California Div. of Mines

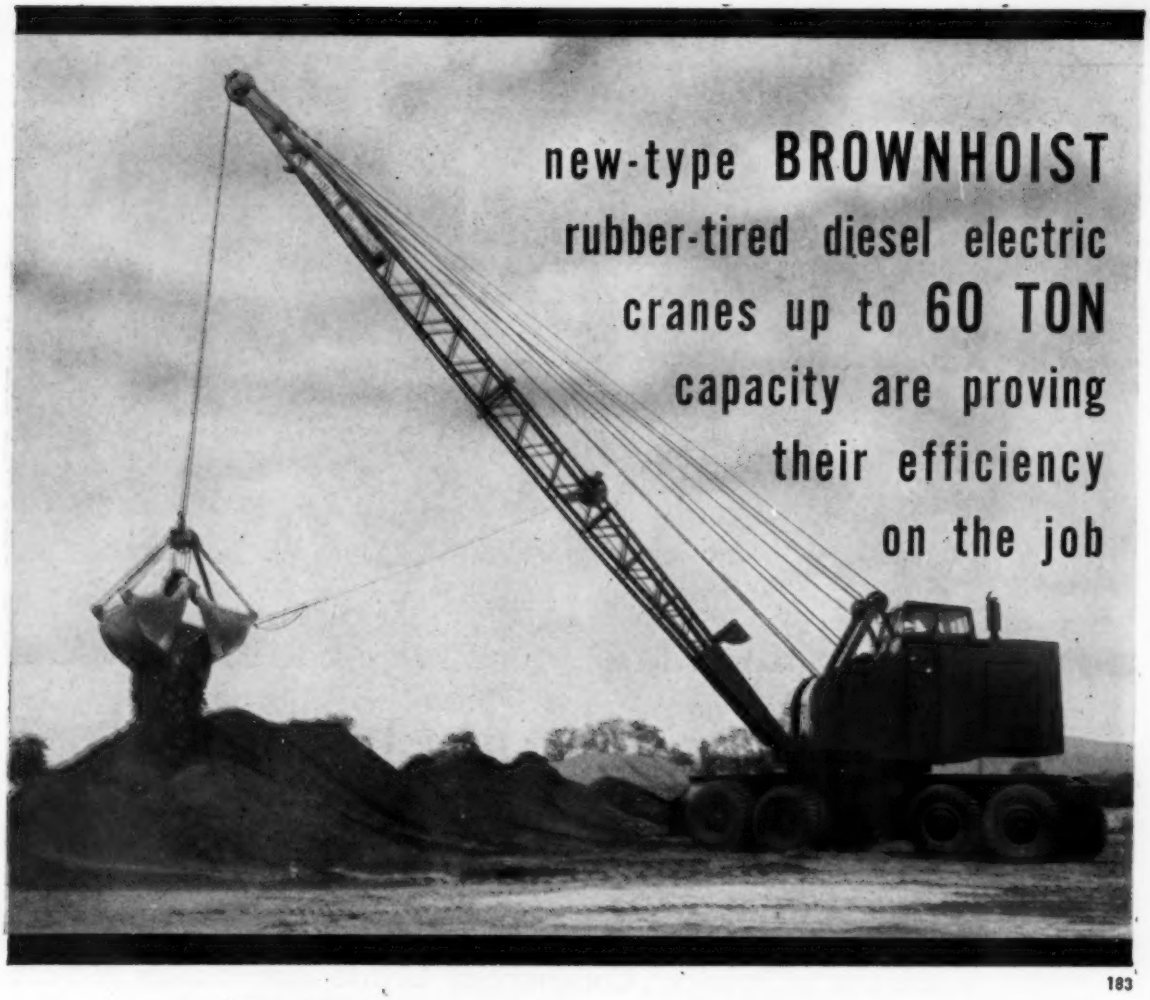
Clays and Clay Technology, an up-to-date treatise on the subject of this natural resource and its use, has been published recently by the Division of Mines in the Department of Natural Resources of the State of California.

There are seven sections in the book covering the following subjects: geology and mineralogy, properties, methods of identification, and technology in relation to soil science, soil mechanics, ceramics, and the petroleum industry. Most of the material contained represents papers given at the first National Clay Conference, held in Berkeley, Calif., in 1952, which was sponsored by the clay industry, academic interests, and government agencies concerned with clay technology.

Issued as Bulletin 169, the book was authored by more than 25 technical experts in the field, and was edited by Joseph A. Pask, professor of ceramic engineering at the University of California, and Mort D. Turner, geologist of the Division of Mines.

Particularly useful are the many references to works on clay published in many languages and countries.

The bulletin is a basic reference volume of value in laboratory application and for those engaged in the various fields covered by the sections presented. Cloth bound, and well illustrated with photographs, diagrams, and electromicrographs, this 326-page book is priced at $4.50 and may be ordered from the Division of Mines Offices, Ferry Building, San Francisco 11, Calif.



183

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The new Brownhoist Wagon-Cranes are specifically designed to do an outstanding job wherever high mobility and high capacity are required. You'll see them at work performing heavy duty jobs in mines, quarries, steel mills, for railroad and lumber operations and for many other large industries. Equipped with dynamatic clutch, anti-friction bearings at all essential points, power steering, electric travel and electric rotation. Mounted on a 12 wheel crane carrier capable of speeds up to 8 miles per hour, the unit can be operated by one man from easy-to-reach controls. Economical to operate. Available in capacities from 25 to 60 tons. For specification folder or further details, get in touch with our nearest representative or write us at Bay City.

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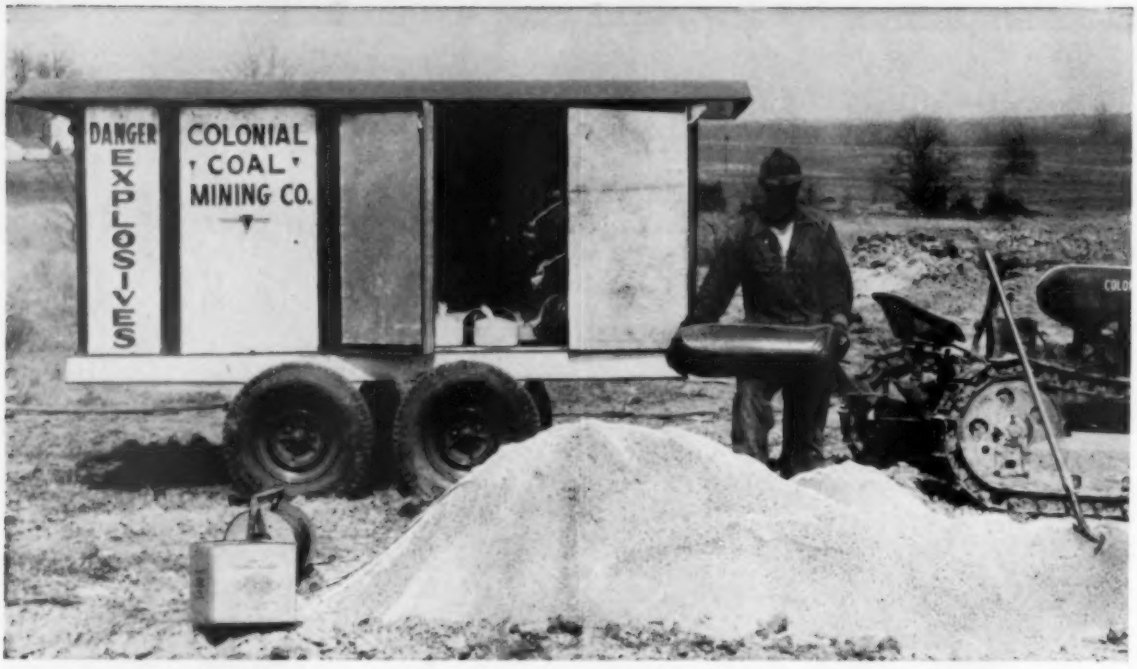
BROWNHOIST



How New Akremite Method Helps Us Cut Explosive Costs 40% to 60%

... main ingredient we use in new "make-it-yourself" explosive is Spencer Commercial Grade Ammonium Nitrate

By JAMES E. MINER, *President, Colonial Coal Mining Company*

THE "Do it yourself" fad is not restricted to the basement workshop as far as the Colonial Mining Co. is concerned. Strip miners of coal now are making their own explosive for overburden shooting.

Hugh B. Lee, president, and Robert Akre, superintendent of drilling and shooting, Maumee Collieries Co., Terre Haute, Ind., have developed a new type explosive for strip and open pit mining. Called the Akremite Blasting Process, Colonial Coal Mining Co. is now using the method under license from Maumee.

Drilling and shooting conditions will vary with each mine so that no rule of thumb can be used to show shooting costs. However, Akremite is saving us 40% to 60% compared with the cheapest commercial explosive and is giving at least equivalent results when shot on a pound for pound basis.

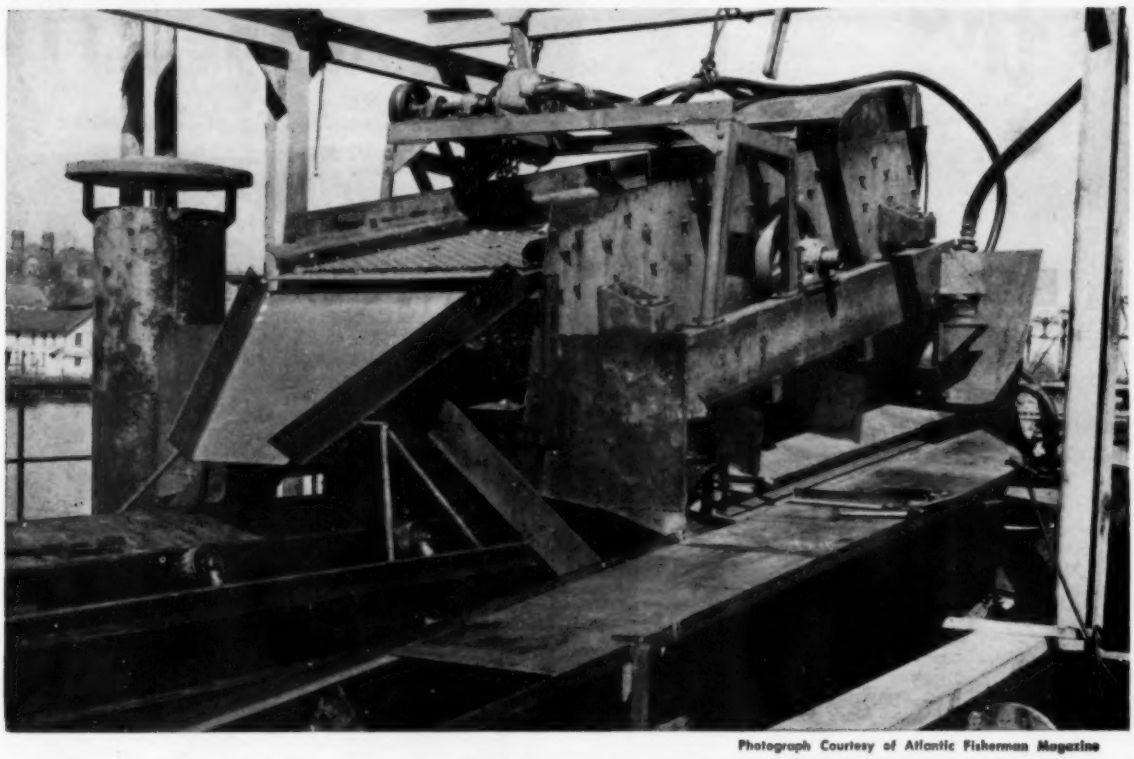
For a specific example of the savings, take our experience at Colonial Mine. We purchased a Bucyrus-Erie 50-R drill and began using Akremite about a year ago. For an 11-month period after using this combination we enjoyed an 18-cent per ton reduction in drilling and shooting costs over a like period before its use, while our stripping ratio was reduced by one yard, from 7½ to 1 to 6½ to 1. Depreciation of the drill is included in the calculations of cost.

The main ingredient in the Akremite Method is a commercial grade ammonium nitrate. We use Spencer Commercial Grade Ammonium Nitrate. A great deal of practical research has been done by the Spencer Chemical Company in cooperation with Maumee Collieries to produce this raw material with the proper moisture content, density, screen analysis, caking quality and ability to take the correct carbonaceous coating.

(NOTE: Spencer Chemical Company will be happy to provide you with further information about the Akremite Method as discussed by Mr. Miner.)

SPENCER CHEMICAL COMPANY
610 Dwight Building • Kansas City 5, Missouri • Baltimore 6600

Keeping OYSTERS "HEALTHY" the job of this SECO SCREEN



Photograph Courtesy of Atlantic Fisherman Magazine

Separates Sand and Drills from Oysters on Deck of Dredge

Oysters are a far cry from aggregates . . . but this on-the-job report from F. Mansfield & Sons, New Haven, Conn., is another interesting example of SECO screenability on all types of difficult screening assignments.

This 4x12 double deck SECO is mounted on the deck of the suction oyster dredge, "Quinnipiac", which operates out of New Haven, Conn.

Here is a new and highly efficient method of ridding the oysters of drills (snails) which cling to and destroy the oysters unless removed. In this operation, the oysters are dewatered and cleaned as they pass over the top deck onto a rubber conveyor. The drills are shaken loose and drop through to the lower deck from which they are discharged and destroyed.

One of the factors that make this installation of such interest to anyone with a screening problem is the fact that this SECO screen does its job at sea, performing smoothly in spite of the pitching and rolling of the dredge caused by the sea.

SEND FOR LITERATURE. Dept. PQ

SECO

TRUE CIRCULAR ACTION

VIBRATING SCREENS

Put Built-in Screening Accuracy on Your Job!

Only SECO has *fully*-controlled true circular action for smooth, accurate screening results. Over 350 models in single, double, triple and 3½ decks.

Write, wire or phone for recommendation

SCREEN EQUIPMENT CO., INC.

BUFFALO 25, N. Y.

Leave the Water ...in the PIT!

Even in Wet Digging...

HENDRIX means MAXIMUM bucket loads for more PROFITS

A TYPE FOR EVERY DIGGING PURPOSE

All Hendrix Buckets available without perforations

¼ to 40 Cubic Yards

Hendrix Lightweight DRAGLINE BUCKETS

Every yard of material dug from a watery pit means a quicker profit on your operations. You can get this extra yardage by using a Hendrix Bucket. It's scientifically-arranged perforations make it a "natural" for wet digging . . . lets water go through . . . leaves more room inside for paydirt.

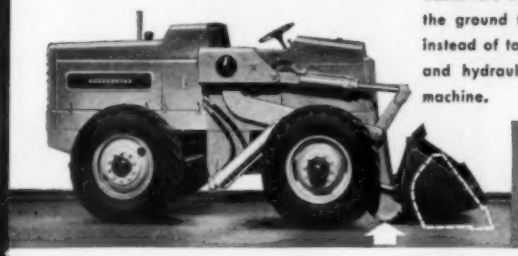
A FULL BUCKET EVERY TIME . . . and a minimum of maintenance cost, both in dollars spent and time consumed, will result in more profitable operations for you. Ask a man who uses a Hendrix . . . he knows!

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

Three completely New PAYLOADER® tractor-shovels with new "more-yardage" features

POWERFUL PRY-OUT ACTION

Tremendous pry-out force is obtained by using the breakout pads on the ground as a fulcrum for leverage. The load forces opposing the pry-out action are thus transferred to the ground through the pads instead of to the axle, wheels and hydraulic system of the machine.



model HU 1 cu. yd.

40° BREAK-OUT at ground level

You can get HEAPED BUCKET LOADS and you get them FASTER and EASIER WITH THIS NEW BUCKET ACTION. Most important of all — you KEEP BIGGER PAYLOADS—because the bucket can be tipped back a full 40 degrees at ground level before it is raised, eliminating spillage.

model HH 1½ cu. yd.

SAFETY and STABILITY

Special boom-arm shape and positioning keeps moving members out of operator's reach at all positions. Close, low, load-carry position and longer wheelbase provide stability and balance for fast maneuvering — with safety.

model HO 2 cu. yd.

These three all-wheel-drive "PAYLOADER" units are outstanding examples of Hough's continuing pioneering and leadership in tractor-shovel design. They have more digging power, get big bucket loads easier, can carry them faster and safer.

They are full of other features and improvements that boost output, operator comfort and safety and that lower the cost of digging, scooping-up, loading, moving and piling earth and bulk-materials.

Your "PAYLOADER" Distributor is ready to demonstrate these new units and what they can do — for you.

HOUGH-DESIGN HOUGH-QUALITY

More Horsepower per bucket capacity than any other standard models. Either diesel or gasoline engines available.

Easy to Operate Fullest operator visibility for safe, fast maneuvering; power steering; powerful hydraulic brakes; adjustable seat with molded foam-rubber cushions.

Powerful Transmissions Powershift transmission is standard equipment on the big model HO; four-speed full-reversing types on model HH and HU. Torque converter drives are standard equipment on all models — multiply engine torque up to 350% — act as shock absorbers for the entire power train.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
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THE FRANK G. HOUGH CO.
750 Sunnyside Ave. Libertyville, Illinois

Send full information on new "PAYLOADER" Tractor-Shovels

- ☐ Model HU 1 cu. yd.
- ☐ Model HH 1½ cu. yd.
- ☐ Model HO 2 cu. yd.

Name .....
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Company .....
Street .....
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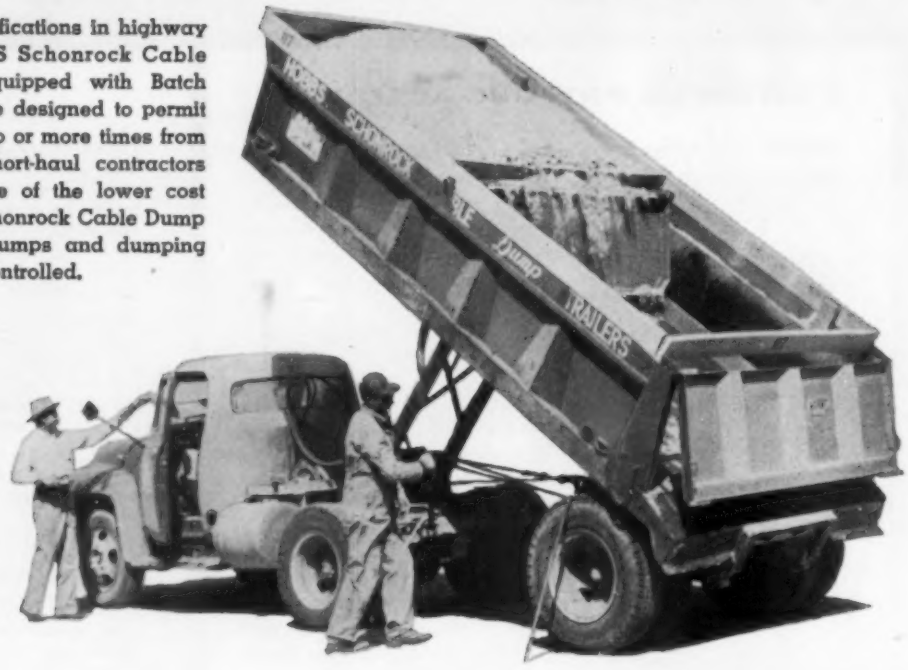
MULTIPLE DUMPING AT SPECIFIED INTERVALS WITH HOBBS *Schonrock Cable Dump* TRAILERS

To meet rigid specifications in highway construction, HOBBS Schonrock Cable Dump TRAILERS equipped with Batch Gate Attachments are designed to permit operators to dump two or more times from one trailer. Thus short-haul contractors are taking advantage of the lower cost hauling of HOBBS Schonrock Cable Dump TRAILERS. Size of dumps and dumping interval are easily controlled.



HOBBS TRAILERS

Aggregate Hauling Contractor Says:

"Batch Gates Make HOBBS Schonrock Cable Dump TRAILERS Perfect Tools for Short-Haul Contractors"

The practical application of batch gate dumping of partial loads at specified locations was conceived by A. C. McMillian, (left), Fort Worth Contractor who operates 24 HOBBS Schonrock Cable Dump TRAILERS equipped with batch gates.

These gates designed by Hobbs Manufacturing Company as an accessory allow contractors to use HOBBS Schonrock TRAILERS in conjunction with dump trucks and on projects which formerly were out of their operational scope. And according to Mr. McMillian, less manpower, less maintenance and less fuel are required in operating cable dumps.

Need for lower operating costs and necessity to meet rigid specifications have caused earth-hauling contractors to realize the importance of the increased capacity, rugged construction and operating ease of HOBBS Schonrock TRAILERS.

For further information write or call collect....

HOBBS MANUFACTURING COMPANY 609 NORTH MAIN STREET FORT WORTH, TEXAS

SALES AND SERVICE IN 38 STATES AND MAJOR CITIES — DISTRIBUTORSHIPS AVAILABLE IN SOME AREAS

American Explosives and Blasting Supplies Clear the Way for America's Superhighways!

COMPLETE OR UNDER CONSTRUCTION

AUTHORIZED OR PROPOSED

Here's the Breakdown

Highway	No. of Contractors Supplied	Time	Types of Rock	American Explosives Used
Pennsylvania Turnpike	5	1939-40	hard limestone, shale, limestone, traprock, sand rock	40%, 60% ammonia and gelatin dynamites
Philadelphia Extension Turnpike	5	1949-50	hard limestone, shale, limestone, traprock, sand rock	40%, 60% ammonia and gelatin dynamites
Western Pennsylvania Extension	3	1951	hard limestone, shale, limestone and sand rock	40%, 60% ammonia and gelatin dynamites
West Virginia Turnpike	4	1953-54	shale and sandstone, hard, medium, soft	40% ammonia and gelatin plus semi-gels
New York Thruway	8	1953-55	hard to soft limestone, gneiss rock, traprock, hard shale	40%, 60%, 75% standard gelatin and semi-gel
Ohio Turnpike	2	1953-55	shale and limestone	40% standard gelatin
Kentucky Turnpike	2	1954-55	limestone	semi-gel
Northeastern Pennsylvania Extension	5	1954-55	sandstone and limestone	semi-gel and 40% gelatin
Palisades Parkway	3	1954-55	granite and traprock	semi-gel and 60% gelatin
Maine Turnpike	4	1954-55	granite	semi-gel and gelatin
Massachusetts Turnpike	3	1954-55	traprock, limestone and metamorphosed shist	semi-gel and 40% gelatin

The spread of superhighways over every type of terrain presents a wide variety of construction problems. Leading contractors on major expressways, and quarry operators who supply stone for the right of way, rely on American Explosives for safe, economical handling, good breakage, and dependable results with every shot.

THE AMERICAN LINE:

High Explosives	Electric Blasting Caps
Permissibles	Instantaneous
Blasting Powder	Regular Delay
Blasting Caps	Split-Second Delay

Blasting Accessories

If it's AMERICAN, it's dependable!

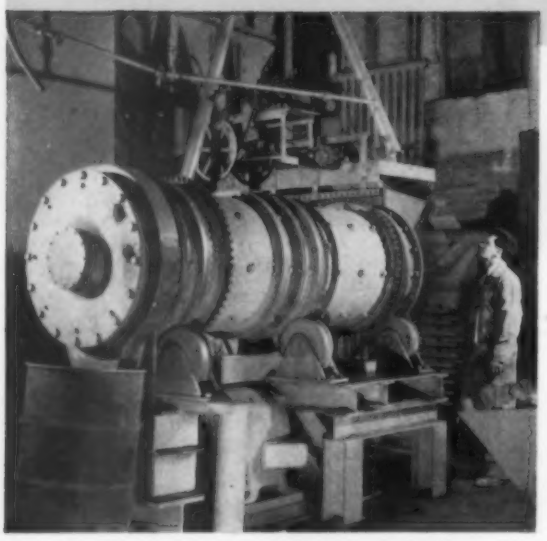
AMERICAN CYANAMID COMPANY
EXPLOSIVES

AMERICAN Cyanamid COMPANY

EXPLOSIVES DEPARTMENT
30 Rockefeller Plaza • New York 20, N. Y.

Sales Offices: New York City, Latrobe, Pa., Pottsville, Pa., Scranton, Pa., St. Louis, Mo., Bluefield, W. Va.

Here's How Industry's Top



Precision tests in the Allis-Chalmers research laboratory determine grinding characteristics and power requirements—accurately predict full-scale performance.

helped increase smelting capacity at the BUNKER HILL & SULLIVAN MINING AND CONCENTRATING CO. Kellogg, Idaho

IN lead smelting, Bunker Hill & Sullivan uses a charge for their roasters made up of limestone, reclaimed slag, lead concentrates and circulating by-products. Realizing that a uniform and porous charge would increase roaster capacity and produce an improved sinter, Bunker Hill & Sullivan decided to pelletize the roaster charge. In order to achieve a uniform mixture and control the pellet size, it was necessary that all materials be crushed to minus ¼ inch, with the bulk of the materials minus 10 mesh. The main charge ingredients requiring crushing consisted of limestone, reclaimed slag and return sinter. Allis-Chalmers was asked to help with this problem.

Here's what Allis-Chalmers did:

Lab Tests The Allis-Chalmers lab team went to work on samples of these three materials. Impact and compression tests were made to determine crushing resistance. Grinding characteristics were established in rod mill grindability tests. Slag was found to be the ingredient most resistant to crushing. The tests also helped determine type and size of equipment needed and power requirements. All this vital information was obtained easily and at little cost.

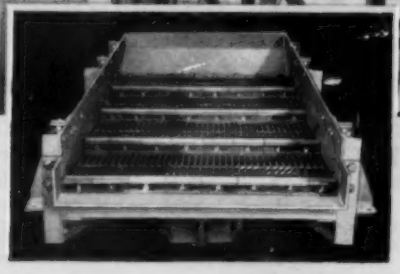
Pilot Plant Run Because an unusually large dry grinding rod mill had been indicated by the lab tests — and to reveal any factors which may have remained hidden in tests on small samples — twenty tons of slag were run in the Allis-Chalmers pilot plant. Evaluation of all test findings by specialized engineers indicated the application of a *Low-Head* screen, *Hydrocone* gyratory crusher and an Allis-Chalmers dry grinding peripheral discharge rod mill for this crushing problem. The equipment is now operating in the Bunker Hill & Sullivan plant where it produces the required finely crushed material for production of pellets.

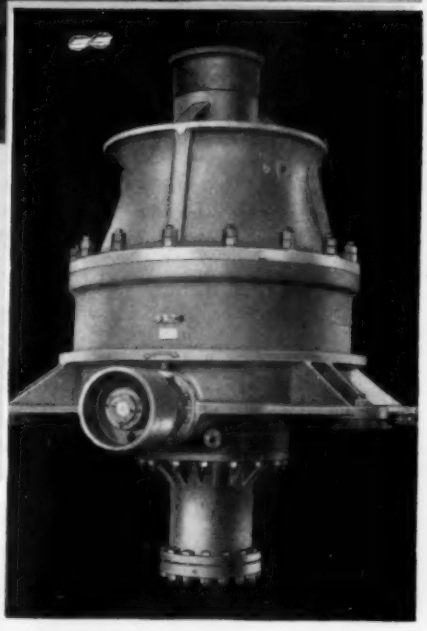
Help for Your Staff or Consultants
The same personal, expert attention is available to you. Your A-C representative, backed by industry's top technical team, is always ready to help you make your operation as efficient and profitable as possible — whether it's a matter of planning a complete plant or merely helping you over an occasional rough spot.

Continuous Service Most important is the fact that Allis-Chalmers interest does not terminate with the installation of equipment. Laboratory facilities, periodic equipment checkup, maintenance, and fast emergency parts service are yours continuously from Allis-Chalmers.

ALLIS-

Technical Team





In the Bunker Hill & Sullivan operation, a 48-in. *Hydrocone* crusher preceded by an Allis-Chalmers rod deck screen produces a minus ¾-in. feed for the 9 x 12 Allis-Chalmers dry grinding peripheral discharge rod mill which delivers a minus 10 mesh product for pelletizing.

Low-Head and *Hydrocone* are Allis-Chalmers trademarks.

A-4402

ALLIS-CHALMERS Equipment for the Mining and Rock Products Industries

Crushers — all types
Vibrating Screens — all types — Grinding Mills — all types
Kilns — Coolers — Washers — Dryers — Smelting Equipment

CHALMERS

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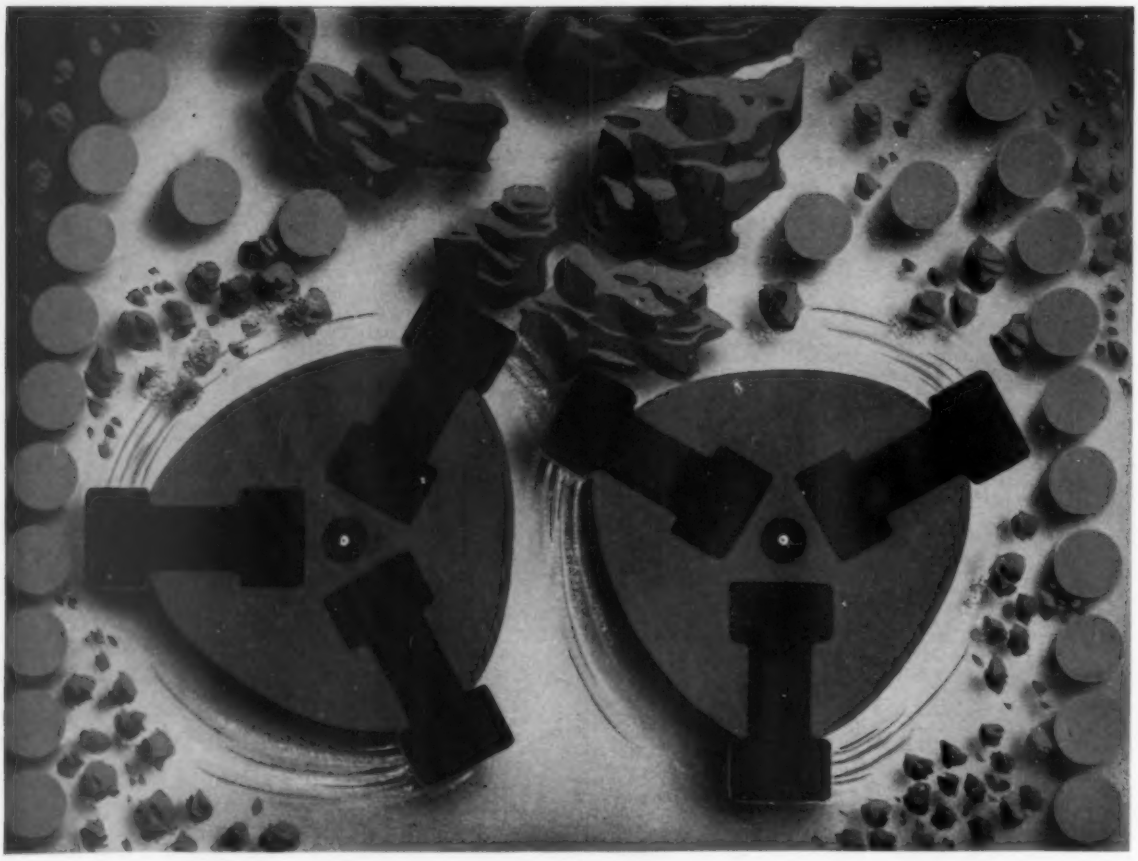
For complete information, call your nearest A-C district office or write Allis-Chalmers, Milwaukee 1, Wis.



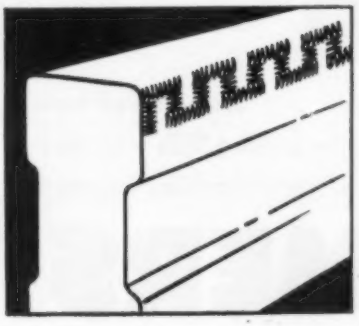
CRUSHER MAINTENANCE CUT 50% with Coated Tube Stoodite!

Crushing operations undoubtedly present one of the most savage wear problems in industry. Here's a typical example of how one operator is reducing wear, cutting costs and saving maintenance hours with Stoody hard-facing alloys.

A rock products plant in Pennsylvania, crushing hard lime rock, required the welding services of one shift each night to repair daily wear damage on their impeller type crusher. Upon recommendation of the Stoody engineer, a change in hard-facing material was made to Coated Tube Stoodite. *One shift operating every other night is now sufficient to keep this crusher in top operating condition!* Another plant operated by the same company also switched to Coated Tube Stoodite with similar results—*4 times longer breaker bar life with a big release of man-hours for other maintenance requirements!* Daily output of these two plants over the past year has averaged more than 3500 tons each per ten hour day.

APPLICATION DETAILS

Breaker bars are hard-faced with Coated Tube Stoodite only on the leading faces. Beads approximately ¾" wide and separated ¾", extend down the face 2½" to 3". They are alternately connected top and bottom. This saw-tooth pattern effects easier breakage because of improved bite, reduces hard-metal requirements and gives equal or superior results to a solid deposit. Skip welding is employed to minimize heat build-up. Succeeding applications of hard-metal are made in the spaces between previous deposits.



Coated Tube Stoodite (Stoody 1293) is a manual electrode. Deposits possess excellent impact strength and high wear resistance. These features, combined with low cost and fast deposition, make this an excellent wear-resistant alloy for most heavy equipment. Ask your Stoody dealer (consult the yellow pages of your telephone directory) for data or write direct.

STOODY COMPANY
11971 East Slauson Avenue
Whittier, California

Gravel Producer Adds Heavy Media Separation

S. N. Moses Jr., service engineer Western Machinery Co., and Claude Smith, superintendent of the Northville plant.

another ON THE SPOT report

HEAVY media separation is becoming increasingly important as a means of upgrading sand and gravel deposits to meet stringent specifications for deleterious materials. One of the latest producers to install an H.M.S. unit is Harry Pickitt, a well-known Michigan contractor and aggregates producer, at his Northville operation, about 25 miles northwest of Detroit.

There the deposit averages 12 to 14 percent deleterious materials (chert, shale, mud balls, etc.), a condition making it unsuitable for concrete or bituminous aggregates, according to both state and Wayne County specifications, which specify not more than 10 percent deleterious materials. By using a heavy media plant, in which the media itself has a specific gravity of 2.55, the Pickitt plant is able to float off the deleterious materials, reducing the content to less than 3 percent—and at an added operating cost of only a few cents per ton.

The operation, located 1½ miles west of Northville, incorporates two portable crushing and screening plants and the new heavy media Mobil-Mill plant, which is a permanent installation. This adaptation of H.M.S. with portable units is the first of its kind in the industry. Harry Pickitt began the portable operation at the Northville pit about 14 years ago, but it was not until the summer of 1954 that the heavy media plant was set up. This new installation has a capacity of about 100 t.p.h.

The deposit, of glacial outwash origin, is about 50 to 60 ft. thick, with the water table averaging 45 ft. Generally the gravel is excavated to the water table level, although there is excellent material available below. The upper portion (about 10 ft.) is usually removed and sold as road gravel without processing. The remainder of the deposit, however, is run through the plant.

Feed to the first portable plant (a Pioneer washing unit) is handled by a Northwest 25 diesel-operated dragline carrying a ¾-cu. yd. Page bucket. The material is sized on a 4- by 12-ft. two-deck screen operated wet, which has a ⅜-in. top deck and 3/16-in. bottom deck. The fines are piped to a pond, where a second Northwest 25 dragline reclaims the materials to trucks; the pea gravel is taken *via* belt conveyor to a truck bin; and the oversize is belt-conveyed to the second portable plant (a Diamond unit). This plant incorporates a two-deck screen, which is operated in closed circuit with a 10- by 36-in. jaw crusher and a 26- by 20-in. double roll crusher, producing minus 1½-in. material. The jaw crusher takes plus 2-in. material from the screen, and the roll crusher minus 2-in. plus 1½-in. material. The desired product is trucked to a stockpile adjacent to the heavy media plant.

At the Wemco Mobil-Mill (a prefabricated heavy media plant), which is located on the pit floor, the gravel

A general view of the heavy media installation at the Harry Pickitt gravel plant, Northville, Mich. The field conveyors lead to a rinsing screen, then to the heavy media plant, (right).

The rinsing screen, producing minus 1½-in. plus ⅜-in. material for the H.M.S. plant.

is reclaimed from the stockpile by a Northwest dragline fitted with a Page ¾-cu. yd. bucket and fed to a 5-cu. yd. hopper mounted over a 24-in. belt conveyor at ground level. This conveyor (45-ft. centers) is fed by a reciprocating plate feeder and discharges to a second 24-in. by 45-ft. inclined belt conveyor which feeds a Simplicity 3- by 12-ft. two-deck screen fitted with four water spray bars. The two conveyors (Barber-Greene) are driven by a Waukesha gasoline engine.

The screen, which performs the initial washing, has a ⅜-in. top deck and a 3/16-in. bottom deck. Minus 1½-in. plus ⅜-in. gravel from the screen is fed to the heavy media separator drum by a 24-in. by 70-ft. belt conveyor, while the pea gravel is taken out and belt-conveyed to a steel truck bin; the fines through the bottom deck are piped to a waste pond nearby. This preliminary washing ahead of the H.M.S. plant is important, since any coating of clay or fines on the gravel particles will tend to increase media loss.

The heavy media plant, supplied by the Western Machinery Company, is a Mobil Mill Size No. 4M unit, incorporating a single-compartment 8- by 8-ft. drum separator mounted horizontally on trunnions and rotated at about 2 r.p.m. by a 7½-hp. motor. The drum is charged with a heavy pulp mixture consisting of about 60 percent magnetite and 40 percent ferrosilicon, which has an overall specific gravity of 2.55. The two materials are finely ground, the magnetite being minus 200-mesh and the ferrosilicon minus 100-mesh. Checks are made periodically by the plant operator to see that the specific gravity remains as close to 2.55 as possible.

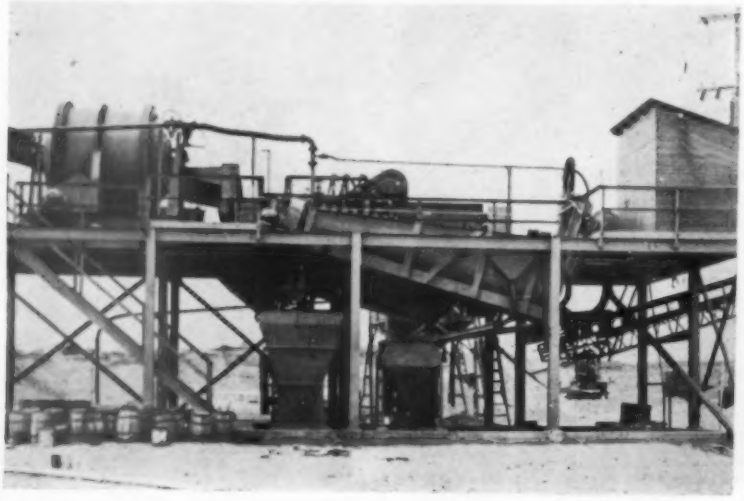
In the revolving drum, the heavier gravel particles sink and are picked up by lifters and chuted through the discharge end to a Simplicity 6- by 20-ft. two-deck horizontal wet-operated vibrating screen, driven by a 20-hp. motor. The lighter particles ("float", consisting predominantly of shale and chert) are also directod to the Simplicity screen.

The sink and float particles are kept separated on the screen by means of a divider plate mounted longitudinally about 12 in. from the side; the float portion is screened on the narrower portion. The screen, having a 3/16-in. slotted mesh top deck and ⅛-in. mesh bottom deck, is equipped with two water spray bars (on each deck), which are used to wash the heavy media from the gravel particles. The finished product is carried on a 24-in. by 40-ft. belt conveyor to stockpile, while the float portion is transferred by an 18-in. by 30-ft. belt conveyor to a 5-cu. yd. truck bin. Both materials are trucked from the plant, the float rejects being mixed with pit run gravel for use as fill or on secondary road construction.

To reclaim the heavy media for re-use in the process, there are two circuits—one handling the media directly from the screen and the other handling the wash water containing approximately 10 percent of the ferrosilicon and magnetite. Mounted beneath the Simplicity screen is an adjustable media diverter buggy (see flowsheet), through which the media from the first portion of the screen (ahead of the spray bars) drains to a cone-shaped media sump. A Wemco 4-in. sand pump driven by a 30-hp. motor then returns the media to the separator.

Wash water from the screen drains through the buggy to a wash sump hopper mounted adjacent to the media sump. This is served by a second Wemco 4-in. pump (driven by a 20-hp. motor) which pumps the media and water to a 36- by 36-in. Jeffrey drum-type magnetic separator. The magnetite and ferrosilicon collected here is fed first to a 36-in. by 18-ft. 10-in. Wemco spiral densifier, then to a Dings 6-in. demagnetizing coil, and finally to the media sump hopper, to be returned to the process. The purpose of the Dings coil is to remove the partial magnetism imparted to the media as it

A ¾-cu. yd. dragline excavating gravel at the Northville pit. The bank is 45-ft. high.



A closeup of the heavy media plant, showing the 8- by 8-ft. drum separator, the screen, and the densifier mounted on the platform, and the media return sump and wash hopper pump sump below.

Model 363 shown with car unloader. Lengths to 35 feet. Capacities to 200 tons per hour. Swivel wheels for radial stock piling. Wide range of accessories, including screens.

MOVE

MOVE bulk materials the cheapest way.

Model 374 shown with flanged wheel for radial stock piling. Available with steel wheels or pneumatic tires. Lengths to 60 feet. Capacities to 430 tons per hour. Wide range of accessories, including vibrating screens.

MOVE sand, gravel, cement, wet concrete, coal, coke, ashes, chemicals — almost any bulk material.

MOVE with machines that are truly portable — easily moved around the yard, or towed on the highway.

MOVE materials continuously with less horsepower, less labor, less cost.

MOVE today toward greater profit.

Let us show you how Barber-Greene can reduce your costs.

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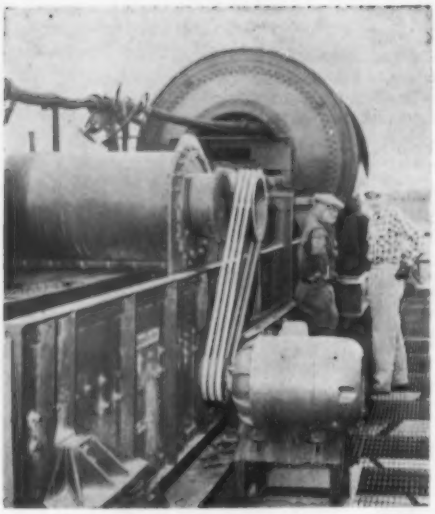
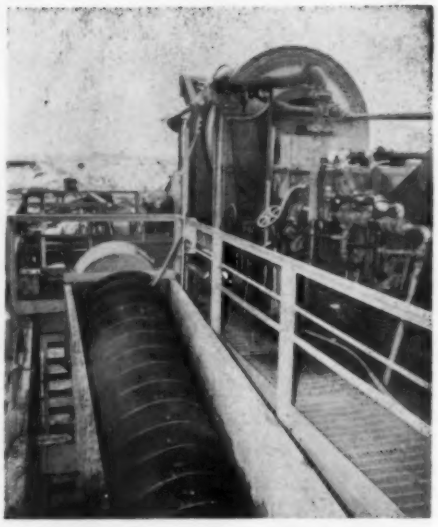


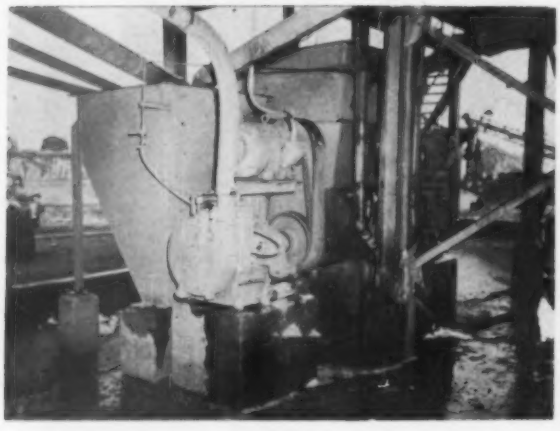
Left: A closeup of the 6- by 20-ft. double-deck screen and 8- by 8-ft. drum separator.

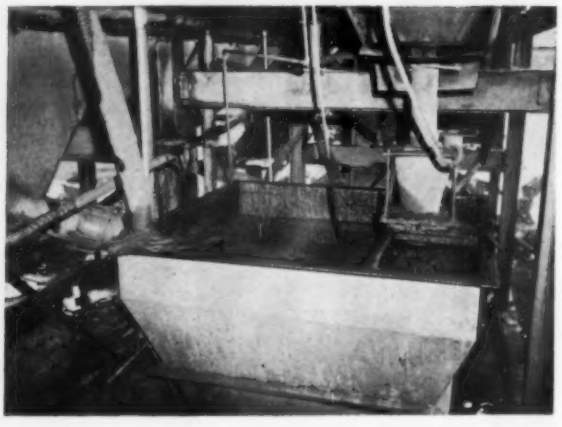
Right: The 36-in. spiral densifier for the heavy media.

Below, left: Wash water and media are collected in this wash hopper pump sump and pumped by the 4-in. pump (foreground) to the magnetic separator above.

Below right: The media return sump, with the demagnetizing coil on right. The latter demagnetizes the media discharged from the densifier above.







passed through the drum magnet separator, thus restoring the non-settling characteristic to the media. Wash-water from both the densifier and drum magnet separator units is also piped to the wash sump hopper to be reprocessed through the magnetizing circuit.

The Wemco Mobil-Mill plant is of all-steel construction. In order to facilitate the dismantling of the plant for moving to a new location, the steel columns are bolted to steel plates; these in turn are bolted to steel studs embedded in the concrete foundation and piers. The floor beneath the plant is concrete and slopes to the center to a small sump pump, which collects any water and media accumulating there, returning it to the media return sump. This pump is also used to add media to the process whenever necessary.

Claude Smith is superintendent of the Northville plant. In addition to the Northville operation, Harry Pickitt has portable plants at Battle Creek, Ypsilanti, and Allegan (which is also the home office). Ammon E. Schreur is Mr. Pickitt's partner and also the engineer for the firm. W. Conklin is secretary and treasurer. The sales outlet for the Pickitt plant at Northville is Heichman & Van Every, who operate a truck scale at the plant site.

Fred Witmer, E. J. Nieman Retire from Ohio Lime Co. After Years of Service

Fred Witmer, who has been president of the Ohio Lime Company, Woodville, Ohio, for many years, recently retired from this post because of ill health. At the same time the company announced the retirement of E. J. Nieman, vice-president.

Mr. Witmer began his career in the lime business early in the century with the Warner Company at Philadelphia. In 1916 he and Mr. Nieman and other associates founded the Ohio Lime Company. He became president of the firm ten years later. Mr. Witmer has served as director of the National Lime Association for many years, and as an officer of the Finishing Lime Association of Ohio. He has been active in several civic and business organizations, and will be retained by his firm in an advisory capacity.

The following appointments were announced to fill the vacancies created by these retirements and also the position of the late D. C. Bittinger.

A. H. Nieman now becomes president of Ohio Lime Co.; Franklin Witmer is vice-president; and Frederick D. Witmer is general manager.

Robert Mortimer has purchased a sand and gravel concern near Anthony, Kans., from Jerry Shaw, and intends to change its name to the Anthony Sand and Gravel Company.

New Nova Scotia Development of National Gypsum Company Allows Year-Round Operation

A $6,000,000 Solution To Problem of Icebound, Low-Tonnage Shipping

WHEN National Gypsum Company's new quarry, crushing plant, and shipping facilities near Halifax, Nova Scotia, were recently unveiled, they proved to be among the most impressive features of that company's current five-year, $75,000,000 expansion program. National has proven out 200,000,000 tons and started production from the largest and first known gypsum deposit in North America. The first shipment was recently made from the new dock facilities at Wright's Cove, across the bay from Halifax, to the company's Baltimore plant.

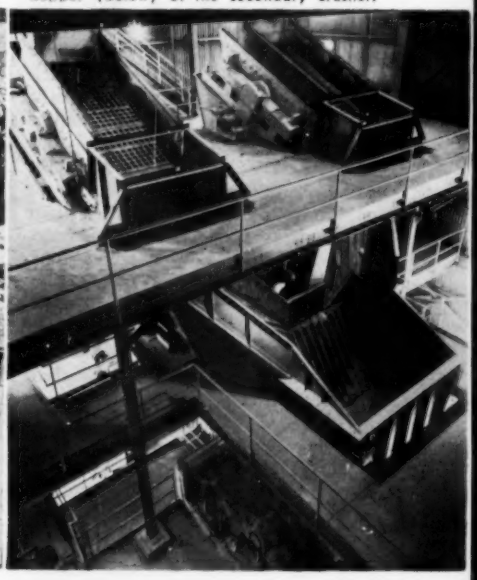
This new $6,000,000 development is primarily an answer to problems inherent in the former operation at Dingwall on Cape Breton Island to the north, which for many years had supplied the company's seaboard plants. While there was no problem of dwindling reserves at Dingwall, optimum operation was mandatory in order to bring out the 1,000,000 annual maximum tonnage during the seven months in which shipping was not icebound.

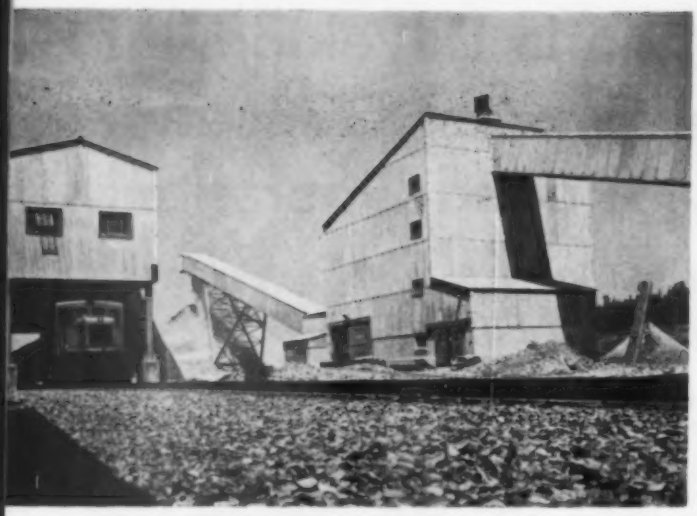
One of the main reasons for moving to Halifax, therefore, was to make year-round operation possible. In addition, the economy of water shipment from the former quarry to the States is further enhanced by the fact that approximately 500 miles are cut from the round-trip haul to National's plants at Savannah, Baltimore, and Portsmouth, N. H., and to new eastern plants under construction. Shipping at Dingwall was limited to 11,000 ton bottoms, and then at seasonal dredging expense. At Wright's Cove there are no channel limitations, and the company has now ordered three 15,000-ton ships from German firms—one to be delivered this year, and two in 1956. National is presently shipping in 10,000-ton vessels under a lease arrangement.

As a result of preliminary studies initiated five years ago, National Gypsum geologists moved into the area in 1951. By July of that year, the first diamond drill was moved to East Milford (about 42 miles from Halifax), where National had acquired gypsum rights to 12,000 acres of land. Two years and 50,000 ft. of drilling later, reserves for better than 100 years of operation were proven. The company purchased 1,000 acres of land, and, based on the geologists' findings, a 140-acre area, having least overburden and highest quality gypsum, was selected as the quarry site. The overburden of this block averages 25 ft., and to date, under the direction of Edward D. Brown, vice-president of National Gypsum's Canadian subsidiary, 15 acres have been cleared of about 1,000,000 cu. yd. of dirt, clay, and rock. There are approximately 3,000,000 tons of ore in the area. "To clear the entire 140 acres we

A view of the quarry floor at National Gypsum Company's new operation in Nova Scotia. Diesel shovels are loading 22-ton rear-dump trucks which haul the gypsum rock and dump the material into the hopper of the primary crusher.

Rock from the primary crusher is screened (above). Oversize material goes into the hopper (below) of the secondary crusher.





Above: The conveyor from the quarry is shown entering the secondary crusher and the screening building on the right. Sized rock is conveyed to the stockpile (center) from which it is conveyed to the car-loading building (left).

Above, right: Twice a day a train of 35 to 40 cars haul rock to the ship-loading point across the harbor from Halifax. This shot shows the rotary car dump unloading a car at the docksite.

Right: The conveyor on the right is carrying rock from the rotary car dump hopper to the shuttle belt. Discharge from the docksite shuttle belt onto the stockpile is shown on the left.

will have to move about 7,000,000 yards," Mr. Brown said. "This will give us a 20-year supply of gypsum —about 75,000,000 tons."

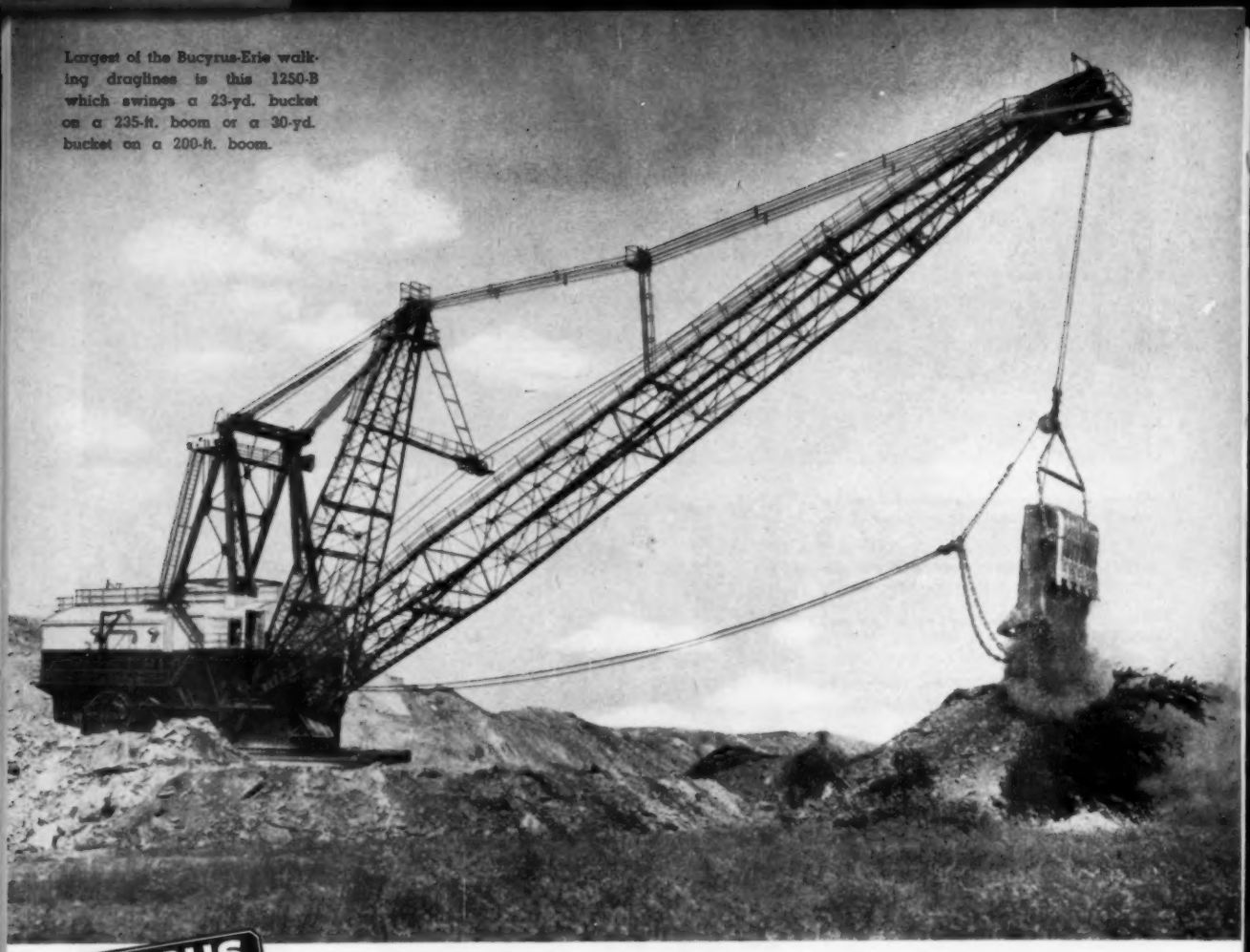
To avoid covering minable gypsum and to obtain favorable grade, two large railroad cuts more than 1,000 ft. long and 35-50 ft. deep were required. Over five miles of track were laid at the quarry, and a railroad bridge with a clear span of 100 ft. was built to cross the Shuhenacadie River. More than 30 acres were cleared of underbrush to locate railroad marshalling yards, plant buildings, an office and a warehouse, a service building, a machine shop, an engine shop, and a storage building.

From shovel to ship, the operation is highly mechanized. The 70-ft. quarry face is drilled and blasted, and the broken rock is then loaded by 2½-cu. yd. Northwest diesel shovels into 22-ton rear-dump Euclid trucks. Material is then hauled to the hopper of the primary crusher, which is located on the quarry floor. Here the rock is fed by a 6-ft. pan feeder to the primary, whose 36-in. by 72-in. single slugger roll reduces ore up to 4 ft. in size at the rate of 800 to 1,200 t.p.h. The crusher product is then lifted by 500-f.p.m. belts 150 ft. to the top of the secondary crusher building, where it is screened. Larger pieces go to the secondary for reduction to required size.

Temporarily, "fines" created in the handling of the ore, and those naturally inherent have presented a problem. The virgin material has an unusually high proportion of fines, and with handling, the tendency of this finer material to pack is increased. Although screening for elimination would relieve the situation, these fines are about 75 percent gypsum and they make up 30 to 40 percent of the ore mined. Therefore, the company is investigating the possible benefit of controlled blending in lieu of handling the material just as it issues from the secondary crusher and screens.

At this point the screened ore is lifted 75 ft. by conveyor belt and dropped onto a 10,000-ton live storage pile. It is recovered through a conveyor tunnel below the pile, and travels to the car-loading building, where a shuttle belt loads the rock into the open gondola cars spotted there. Between 70 and 75 cars are loaded each day, to be stored in the yards until removed by the Canadian National Ry. Twice a day the 31-mile haul to Wright's Cove is made with 35 to 40 cars.

This storage and ship-loading facility is on a 150-acre tract across the harbor from Halifax. At dockside, the cars are spotted in a rotary car dump over a hopper. The rock is conveyed from the hopper by belt to a transfer point where a shuttle belt



Largest of the Bucyrus-Erie walking draglines is this 1250-B which swings a 23-yd. bucket on a 235-ft. boom or a 30-yd. bucket on a 200-ft. boom.

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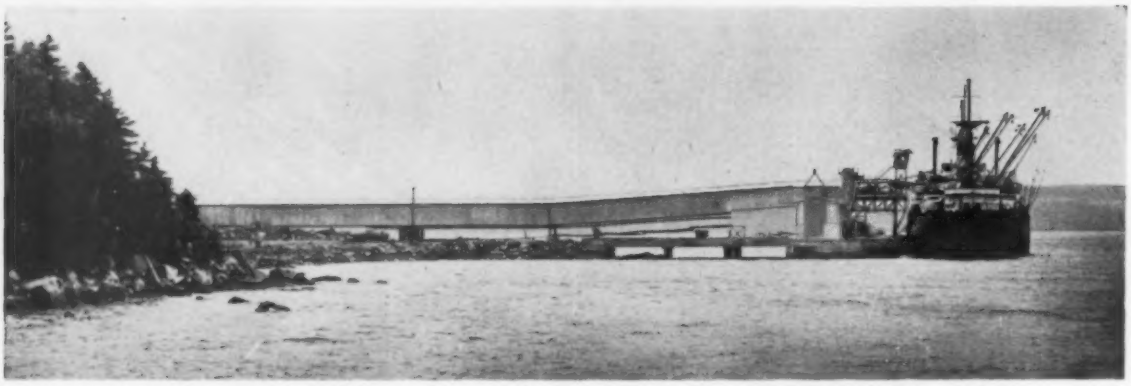
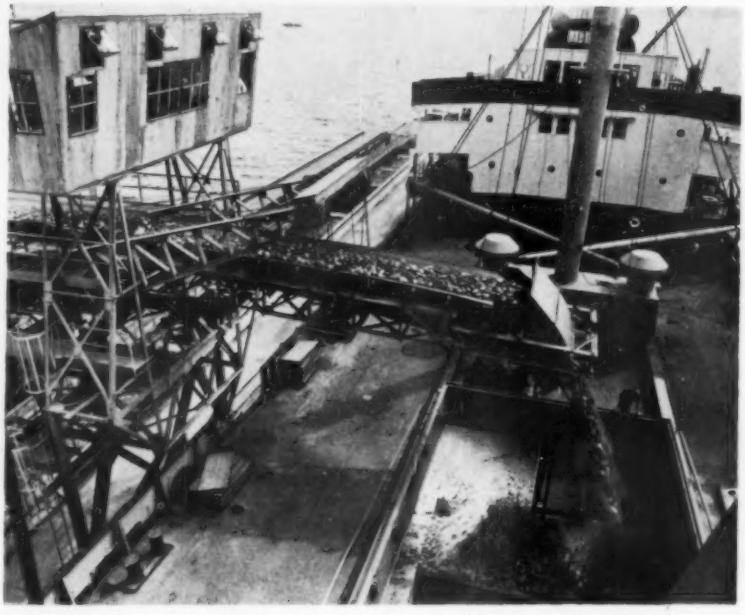


Above: The rail-mounted ship-loader can be seen between the conveyor housing and the ship.

Right: In this closeup rock is shown discharging from the retractable boom on the ship-loader into a hold. Loading and trimming of ships can be handled at the rate of 4,000 t.p.h.



discharges the gypsum on the stockpile to a height of 90 ft. Bulldozers then spread this discharge over a 200- by 500-ft. area. The pile can hold 200,000 tons—two months' shipping at three 10,000-ton vessels weekly.

Beneath this storage area there is a tunnel containing a 60-in. conveyor belt on which the rock is carried to the dock. Here it is elevated on a second belt to the ship loader. This device is rail mounted, and from a retractable boom discharges into the ship's holds.

With respect to the dock, which is almost 650 ft. long, Mr. Brown stated, "The dock design is an innovation in this area where the lack of suitable overburden for the pile penetration was overcome by placing mat or fill on the bottom and then driving the steel piles. This was then dredged to give a minimum of 33 ft. at low water."

In addition to the Halifax activity, National has recently finished expansion of three of its eastern seaboard plants. A new one is under construction at New Orleans, and another will be started in Burlington County, N. J., across the river from Philadelphia.

Company officials hope to expand National's Canadian operations by building plants or acquiring existing companies.

Marquette, General Portland Report Climb in Sales, Earnings

Two major cement manufacturers have reported sales and net income increases in the second quarter and first half of 1955 over corresponding periods last year.

Marquette Cement Manufacturing Co. reports earnings of $2,219,178, or $2.29 a share, for the three months ending June 30 against $1.64 per share on $1,604,029 a year ago. Net income for the first six months of 1955 was $2,867,502, or $2.92 per common share, compared with $2.05 a share on $2,041,474 for the same period last year. Marquette's selling prices for the third quarter are announced as unchanged from the first half and no changes are contemplated this year.

General Portland Cement's net earnings after taxes were $2,180,200 for the three months ended June 30, 1955, compared with $1,741,100 in the corresponding quarter last year. Per share earnings were $1.05, and $.84, respectively. First half earnings amounted to $3,820,400, or $1.84 per share as opposed to $3,117,200, or $1.50 per share, in the same period of 1954.

Smith W. Storey, president of General Portland Cement, reports that the annual productive capacity of the company's newer Dallas, Tex., plant will be increased by 1,250,000 barrels beginning in July. Authorized expansion at the Fort Worth, Tex., plant will add 1,250,000 barrels to this plant's annual productive capacity early in 1956.

Hercules Cement Corporation shareholders at a special meeting in Philadelphia approved a plan to borrow $5,000,000 for the modernization of the firm's Stockertown, Pa., plant. The company plans to replace material handling and milling facilities with modern equipment and four old-style small kilns with a large modern kiln.

Michigan Gravel Plant Supplies Both Ohio and Indiana Turnpikes

most of output supplied in form of ready-mix from three plants

another ON THE SPOT report

WITH a number of large projects already well under way or completed, there remains little doubt that the established commercial aggregates producers can take in their stride the extra demand created by

By WALTER E. TRAUFFER

the nationwide superhighway construction program. In state after state producers have enlarged their existing plants or erected temporary plants in order to supply the needed aggregates without slighting their regular customers. Especially worthy of note is the way one operator in northwestern Ohio is not only supplying aggregates but also ready-mixed concrete for a large turnpike contract.

Northwest Materials, Inc., of Bryan, Ohio, was organized by Glenn J. Pierman, its president, and put its first sand-and-gravel plant in operation in 1941. Since then the company has entered into other fields including ready-mixed concrete and bituminized aggregates. In 1946 highway construction was added, mostly bituminous. Now the company operates ready-mixed concrete and cold-mix asphalt plants in Bryan; a cold-mix asphalt plant in Defiance, Ohio; ready-mixed concrete plants at Angola and Howe, Ind.; a sand and gravel screening plant 6 miles southwest of Bryan, which supplies material for county and township roads; and at Pioneer, Ohio, on U.S. Route 20—13 miles north of Bryan—a Cedarapids crushing and screening plant, a Heltzel ready-mix plant, and a Hetherington & Berner hot-mix asphalt plant.

As a result of these expansions, the company was in an excellent position to bid when contracts were let for the western end of the Ohio Turnpike and the eastern end of the Indiana Turnpike. Contracts were secured for all of the structural and incidental concrete for 28 miles in Ohio and 54 miles in Indiana—82 consecutive miles.

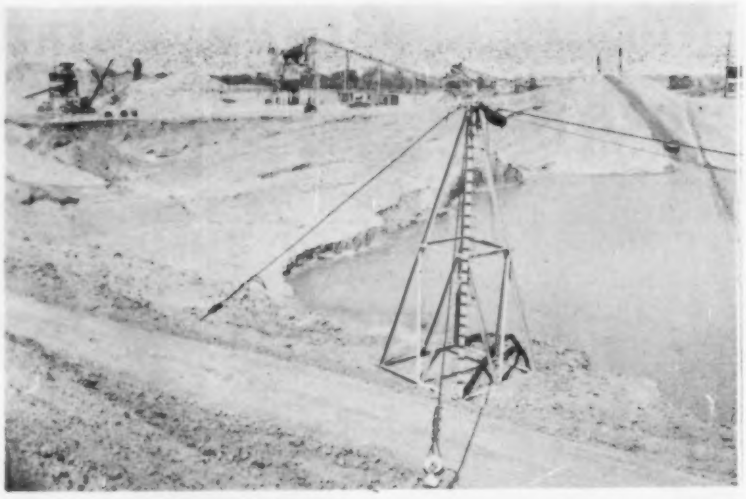
In order to meet this demand, however, additional aggregate production was necessary. Late in 1953, therefore, the company put in operation a new sand and gravel plant in Hillsdale County, 4 miles east of Frontier, Mich. This is operated by a separate corporation, Southern Michigan Materials, Inc., of Bryan, which has the same officers as the parent company. Although intended primarily to supply material for the turnpike, this plant will remain in operation to supply ordinary highway demands in Michigan after the turnpike contracts are completed this fall.

This plant was designed under the direction of Mr. Pierman and D. N. Harman, general manager, working in co-operation with the Barber-Greene Company and Smith Engineering Works. The deposit is sound, hard gravel which meets all Ohio and Michigan state and turnpike specifications for concrete aggregate. The plant, a well designed, permanent-type operation, has a capacity of 100 t.p.h. of sized concrete gravel and 250 t.p.h. of crusher run material and is often operated 24 hours a day. When it was first started up, this plant supplied crusher run material for the turnpike berms, sand for a cushion under the pavement, and some of the aggregates for the concrete pavement. This year the plant has concentrated mainly on aggregates for concrete for the company's turnpike contracts.

This deposit had been known to the company for some years as it

A general view of the Southern Michigan Materials plant, showing the 5-cu. yd. scraper excavator and the tower which supply aggregates for the company's Pioneer, Ohio, plant.

A view of the plant from across the pond, with one of tail towers for the scraper system in the foreground.



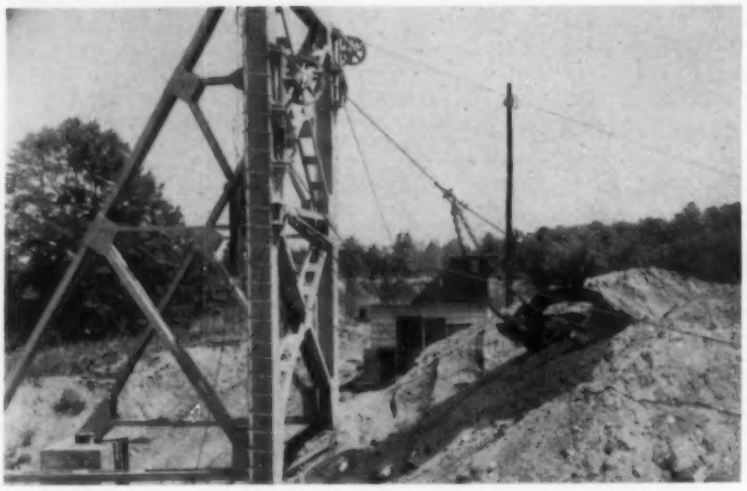
adjoins another pit from which the company has been supplying its Pioneer plant. (The latter deposit had been exhausted.)

The overburden on this new deposit averages 3 to 4 ft. in depth and is removed during slack-periods by a bulldozer, a dragline, and trucks. The deposit has been tested to a depth of 115 ft. without running out of good material. There is considerable variation in gradation throughout the deposit, but it averages 35 to 40 percent sand.

Excavating is being done with a 5-cu. yd. Sauerman Crescent scraper system which is feeding about 275 t.p.h. to the plant. Digging has gone to a depth of 75 to 80 ft. This scraper has been operating in its present location since the plant started up, and it is believed that no move will be needed this summer.

The scraper is operated from a steel head tower and two steel tail towers which are anchored on concrete footings. It is 800 ft. from the head tower to each of the two tail towers, and the latter are 250 ft. apart. A Sauerman 3-drum hoist driven by a 325-hp. 1950 r.p.m. General Motors diesel engine operates the scraper. The center drum of the hoist is for the load cable, which is 1 1/8-in. 6 x 19 steel core Lang Lay wire rope 950 ft. long. The haul-back cable operated from the rear drum is ⅞-in. 6 x 19 hemp center Lang Lay wire rope, 1,950 ft. long. The front drum handles the

(*Continued on page* 138)



Headframe and scraper discharging to the plant over the rail grizzly. (Hoist house in background.)

This view shows how the sloping rail grizzly discharges boulders to waste. (A part of the plant is seen in the background.)

The crusher building with the scalping screen (above) and the special head crushers.

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If you're a new operator who wants to be sure of beating competition . . .

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SINGLE PASS CRUSHING PLANT

The Single Pass Plant shown above produced 40 tons per hour of ¾" rock and gravel, 60 tons per hour of 1", and from 67 to 90 tons per hour of 1½" aggregate. That's the kind of production that lets small operators as well as big outfits make money on road maintenance work, city streets and alleys, small State contracts, base or blanket course jobs, and other jobs where portability and fast set-up are important.

The Cedarapids Single Pass is the most practical plant of this type available. It has plenty of screening capacity, and the hopper and feeder *on the rear end* let you back right up to the nearest gravel bank and start producing *two sizes* of material immediately. Simple design, with few moving parts, keeps maintenance costs low.

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The Model CM twin shaft mixing unit can be used alone to produce cold mix, or combined with a 4816 "Packaged" Drier for turning out hot mix or high type bituminous concrete. The use of a Model CGC Gradation Control Unit assures meeting strict State specifications accurately. Addition of a Model BH Feeder completes the set-up for highly profitable operations.

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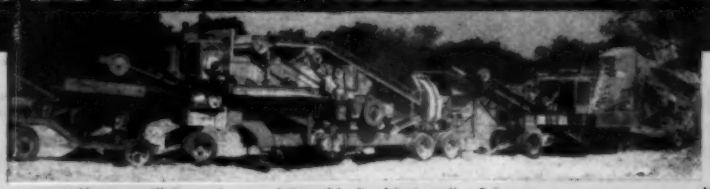

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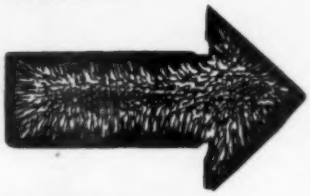

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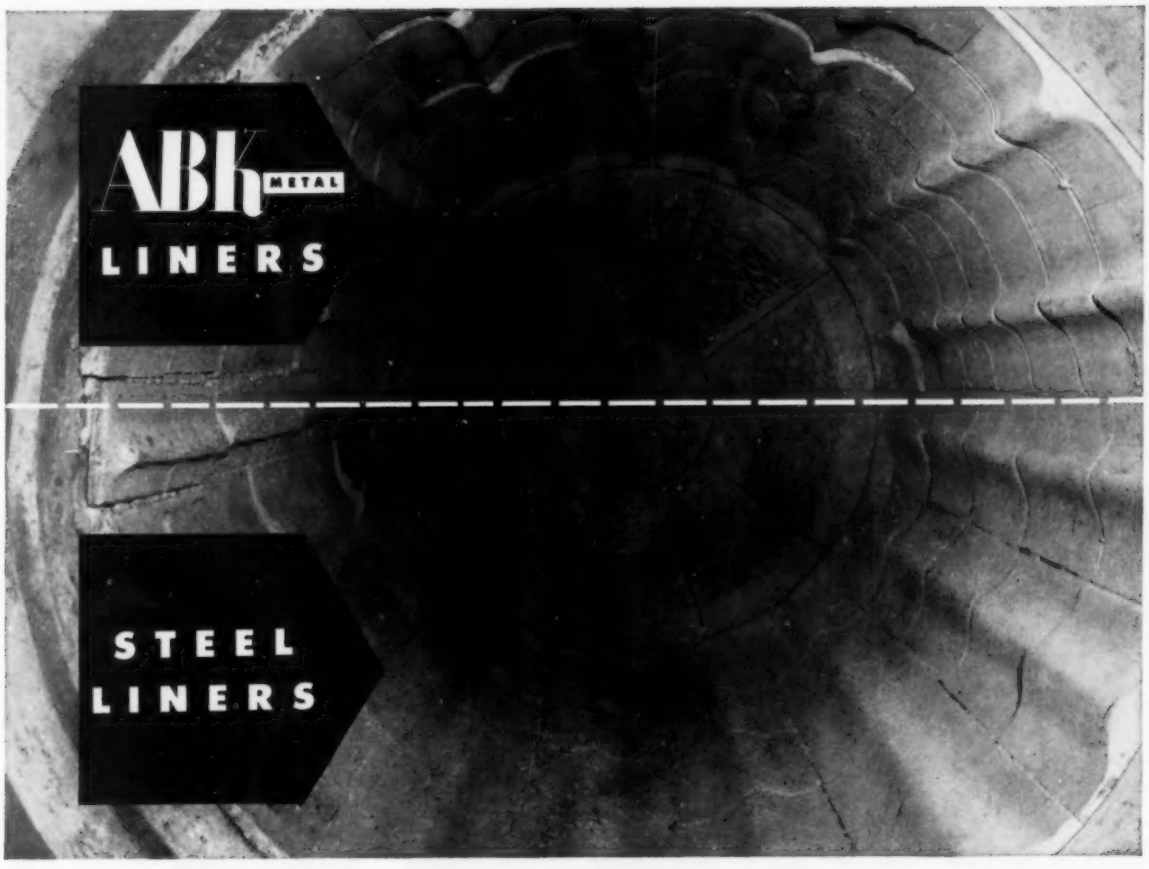

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This photo, taken in a three-compartment grinding mill, shows at the top: ABK Metal liners installed in 1948; at bottom: the *second* set of steel liner plates installed since then. Both types of liners took the identical rough treatment. The ABK Metal liners are still in good condition. It is estimated that, before requiring replacement, the ABK Metal liners will give from 3 to 4 times the service that liners made of other materials will give.

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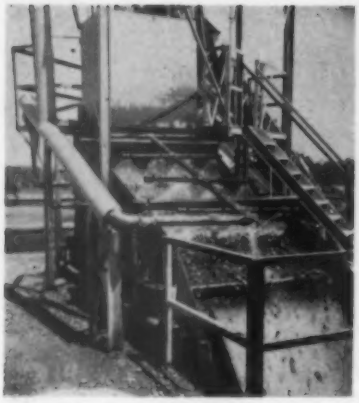
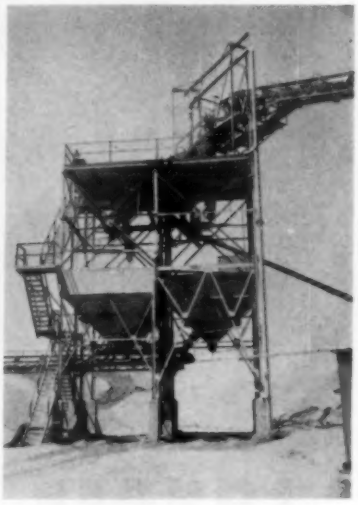


Above: The 5- by 12-ft. 3-deck final sizing and washing screen; when crusher run is made, the material by-passes this screen.

Below: The stockpiling conveyor, fed by the radial stacker. Note cantilever construction. The company's other plant is in background.



Above: The conveyor from the bins (right) feeds the radial stacker, which is here shown feeding to the stockpiling conveyor.

The final screening structure. Note the bins for three sizes of gravel and the conveyor to the stockpiling and loading setup. Sand goes through the pipe (right) to stock-pile.

Michigan Gravel Plant

(*From page* 134)

line used for shifting the tail end of the haul-back line on a bridle suspended between the two tail towers. This is ⅞-in. 6 x 19 hemp center Lang Lay wire rope 1,150 ft. long. American Steel & Wire Co. wire rope is used. The hoist is pneumatically controlled from the top of the hoist house, where the operator can see the pit operations and most of the plant. Air is supplied by a Kellog-American compressor.

Material from the scraper bucket is discharged over a 10-in. sloping rail grizzly for the removal of oversize, which is sometimes quite heavy. The minus 10-in. material drops into a 14- by 20-ft. steel-lined concrete hopper. A 30-in. Telsmith reciprocating plate feeder discharges the material onto a 30-in. by 120-ft. belt conveyor (No. 1) to a 5- by 10-ft. Telsmith 2-deck heavy-duty scalping screen with 3-in. wirecloth on the top deck and 1¾-in. on the bottom.

Plus 3-in. material off the top deck of this screen is chuted to a 10- by 36-in. Telsmith jaw crusher set at 3-in. maximum opening. This unit is driven by a 30-hp. U.S. motor. The 1¾- to 2-in. material off the bottom deck goes to a 36-in. Telsmith Gyrasphere crusher set at 1¾-in. maximum opening. This crusher is driven by a 60-hp. Reliance motor. Products of both crushers discharge onto an 18-in. by 57½-ft. belt conveyor (No. 2) feeding back on the main conveyor.

Minus 1¾-in. material through the bottom deck of the scalping screen is carried on a 24-in. by 141-ft. belt conveyor (No. 3) to the top of the washing building. There the material is discharged onto a 5- by 12-ft. Telsmith Vibra-King screen equipped with sprays. This screen has ⅞-, 7/16-, and 5/16-in. wirecloth on its three decks. The three coarse sizes are chuted to 50-ton steel bins for truck loading. When crusher run rock is being made, the scalping screen and the crushers have larger openings, and the material by-passes the 3-deck screen direct to one of the bins.

The sand — minus 5/16-in. — is sluiced through a pipe to a stockpile, where it drains thoroughly. A Caterpillar D8 tractor with a U-bulldozer blade moves this sand to a point from which loaders can feed it into trucks. This sand is used as a cushion under the pavement.

Gravel in any of the three truck-loading bins can be discharged onto a 24-in. by 138½-ft. horizontal belt conveyor (No. 4). This in turn discharges onto a 24-in. by 91-ft. radial stacker conveyor (No. 5), which is mounted on a circular track per-

(*Continued on page* 152)

Blast Furnace Slag in Agriculture

By COLIN W. WHITTAKER
Fertilizer and Agricultural Lime Section Soil and Water Conservation Research Branch
Agricultural Research Service
U. S. Department of Agriculture

AGRICULTURAL blast furnace slag performs much the same functions in the soil as agricultural limestone and other forms of lime. It is, in fact, a "soil liming material." It corrects soil acidity, or "sweetens" the soil, supplies plant-nutrient calcium and magnesium, and in general behaves like a liming material. Slag may also supply useful quantities of additional plant nutrients and have effects on the soil and on crops not obtained from other liming materials. The physical and chemical properties and handling qualities of agricultural slag are also different from those of other liming materials. Only a very limited amount of slag, however, is processed for use in agriculture at the present time. This is true in spite of the fact that slag has a proven quality as a liming material, that much slag produced is not otherwise utilized, and that potential sources of agricultural slag are well distributed throughout the humid regions where soils normally require liming.

Today the potentialities for the use of slag in agriculture are greater than ever. Improved agricultural slag is available, recent researches have been favorable to slag liming, and a large further increase in the use of liming materials is probable. A survey of the situation, therefore, seems especially pertinent at this time. It is proposed to take a look at the use of blast furnace slag in agriculture, including its preparation for use as a liming material, its production, properties, action in the soil, relative advantages and disadvantages compared to other liming materials, factors affecting future use, and other features.

Blast furnace slag should not be confused with basic slag or with phosphorus furnace slag. Basic slag is sold in agriculture mainly as a phosphate fertilizer, rather than as a soil liming material. Phosphorus furnace slag is used for liming the soil, but is available only in certain limited areas. Both of these slags are very different from blast furnace slag in many ways. They are specifically excluded from the present discussion.

Colin W. Whittaker

Production Slag

Into the blast furnace go iron ore, coke, and limestone. In the extreme heat of the furnace the iron is released from the ore and accumulates as liquid metallic iron in the bottom of the furnace, whence it is drawn off at intervals by tapping. The other constituents of the ore, limestone, and coke mostly combine to form the slag, which thus becomes a vast reservoir of many of the elements found in the raw materials charged into the furnace. In the slag are found most of the calcium, magnesium, silicon, and aluminum of the raw materials.

Other elements such as manganese, copper, molybdenum, and boron, which were present in the raw materials in lesser amounts, are distributed between the slag and the iron in proportions that depend upon the particular element and upon the temperature of the furnace and the basicity of the slag. Small amounts may escape from the top of the furnace in gaseous form or as dust. The carbon of the coke and limestone practically all escapes as carbon dioxide gas.

Like the iron, the slag is molten at furnace temperature and flows to the bottom of the furnace, where it floats on the heavier iron. The slag is also drawn off by tapping, then granulated by immersion in water, and allowed to cool in pits or otherwise processed, depending upon the use for which it is intended.

Chemical and Mineralogical Consumption of Slag

The U. S. Bureau of Mines and the National Slag Association (4) have assembled the results of hundreds of slag analyses. They give the following as the average percentage concentrations and ranges for the constituents more commonly determined in slag:

Constituent	Average (%)	Range (%)
Silica (SiO_2)	36.0	33-42
Alumina (Al_2O_3)	12.4	10-16
Lime (CaO)	41.6	36-45
Magnesia (MgO)	6.2	3-12
Sulphur (S)	1.39	1-3
Iron oxide (FeO)	0.48	0.3-2
Manganese oxide (MnO)	1.34	0.2-1.5

Qualitative spectroscopic analysis slag gives spectral lines corresponding to many other elements, including most of the so-called trace plant-nutrients, or those required by plants in only minute quantities. Chichilo and Whittaker (3), of the United States Department of Agriculture, using refined spectrochemical and other methods of analysis, quantitatively determined the actual amounts of manganese, boron, zinc, copper, molybdenum, and cobalt present in slag. All of these except the last are essential plant nutrients. Cobalt, although not known to be an essential plant nutrient, is an essential element in animal nutrition. Animals obtain cobalt mostly by consuming plants that have absorbed it from the soil. The average concentrations and ranges in parts per 1,000,000 of the above elements in 26 slag samples were as follows:

Constituent	Average p.p.m	Range p.p.m
Manganese	6,564	2,100-11,700
Boron	120	80-200
Zinc	8	2-24
Copper	8	3-17
Molybdenum	..	<1
Cobalt	..	<1-3

Remembering that the manganese values immediately above are for the element Mn instead of the oxide MnO, one sees that these values are

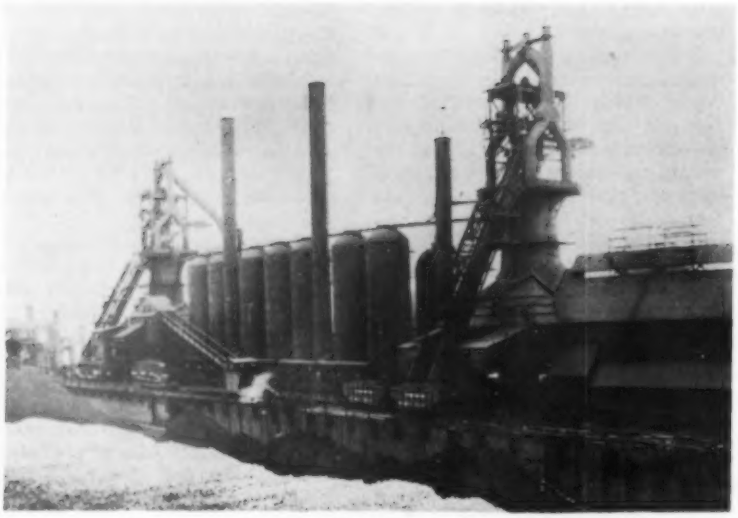
in line with those quoted earlier, which were based upon a much larger number of samples. (To convert parts per 1,000,000 to percent, move the decimal 4 places to the left.) Previously little was known about the slag contents of the other five elements, except that the spectroscope had indicated their presence.

Slag is often loosely described as calcium silicate. The calcium silicates in slag, however, may range in complexity from relatively simple compounds such as calcium orthosilicate to akermanite ($2CaO\text{-}MgO\text{-}2SiO_2$), and gehlenite ($2Ca.Al_2O_3.SiO_2$), and there may be other compounds present such as spinel ($MgAl_2O_4$), and sillimanite (Al_2SiO_5), which contain no calcium. At least 17 compounds of silica, lime, magnesia, and alumina have been identified in slag. In quenched or granulated slag, which is essentially non-crystalline or glassy (see later), definite crystalline minerals form to only a very limited extent, if at all.

Preparation of Agricultural Slag

The processing of slag starts as the molten slag flows from the blast furnace. To produce air-cooled slag, the molten material is simply allowed to flow into slag pits, where it cools slowly in the air. When the pits are at some distance from the furnace, the slag may be transported there in special "ladle" trains that receive the slag directly from the furnace, haul it to the pits, and dump it while still liquid. As the slag cools, it crystallizes into a hard massive solid, forming the minerals already mentioned. Power shovels excavate the slag from the pits as required; it is then reduced to the desired particle size by crushing and grinding.

Left: The raw material — molten slag — being drawn off from a blast furnace.



Below: A modern blast furnace which converts iron ore, coke, and limestone into iron and slag.

While some air-cooled agricultural slag is directly produced in the above manner, most of it is a by-product of crushing and screening operations preparing slag for roofing, railroad ballast, or some other use where a relatively coarse product is required. The unwanted fines unavoidably produced in such an operation, perhaps with some additional processing, are suitable for use in agriculture. Such material may be separated from slag screenings by "topping" on about a No. 8 sieve. Generally speaking, the cost of grinding and screening air-cooled slag would be prohibitive, if done solely to produce agricultural slag. The slag is hard and abrasive, making crushing and screening costs high.

Instead of being allowed to air-cool slowly, the hot molten slag may be cooled or quenched suddenly by contact with water. This is done in various ways, depending upon the product desired. At least one producer directs multiple high-pressure water jets into the molten slag as it falls from the end of the slag trough or runner. The resultant violent, almost explosive, reaction produces a product composed of finely divided particles which are porous, cellular, curiously twisted and contorted in shape, and of extensive surface area per unit weight. This product is variously known as granulated, water-granulated, or quenched slag.

The particle size can be often so controlled in the jet cooling process that no further grinding or processing is necessary. One producer claims to produce directly in this manner a slag approximately 95 percent of which will pass a No. 8 sieve and 20 percent a No. 100 sieve, a sieve analysis corresponding roughly to that of an agricultural limestone meal. The trick seems to be to use multiple high-pressure jets and plenty of water, so much water, in fact, that it carries the quenched slag down a sluiceway into a sump pit, whence a power shovel loads it directly into cars for shipment to consumers. The process is simple and the cost low.

Slag is granulated for a variety of

uses such as base material for concrete highways, fine aggregate for concrete block manufacture, and for the manufacture of cement. The granulation processes producing slag for such uses could, in many cases, be used to make granulated agricultural slag, with only minor changes.

Quenching has little or no effect on the chemical composition of slag, but it does vastly affect its physical properties and increases its ability to hydrolyze in the soil over that of the air-cooled slag. The sudden cooling prevents crystallization, so that the product is glass-like and hence more reactive in the soil than the crystalline slag of equivalent particle size.

Scientists at Ohio State University and its Agricultural Experiment Station (7) believe that fineness is of less importance with granulated than with air-cooled slags because of the porous nature of the former. Granulated slags, 55-60 percent of which pass a 20-mesh sieve, are considered by them to be equivalent to the "agricultural ground" grade of limestone (60 and 90 percent passing 60- and 20-mesh, respectively) for liming the soil. Air-cooled slag, however, being hard and crystalline, must be ground to the same fineness as limestone for comparable efficiency.

The Liming Action of Slag

Ground limestone reacts with acidic soil components, resulting in a rise in the pH values of acid soils, or what the farmer sometimes refers to as the "sweetening" of a "sour" soil. In this process the calcium carbonate of the limestone (and magnesium carbonate, if present) breaks down with loss of carbon dioxide. The calcium and magnesium in slag, although combined as complex silicates, behave very similarly in the soil, except that the initial step is probably hydrolysis with the soil water which releases the calcium and magnesium in forms that readily react with soil acids to raise the soil pH. The end result is similar to that obtained with limestone. Silica is released in the soil simultaneously with the calcium and magnesium.

The potential ability of liming materials to correct soil acidity is measured in terms of the total neutralizing power of the basic calcium and magnesium contents, expressed as the equivalent percent of calcium carbonate. This is known as the calcium carbonate equivalent: the value is 100 for a pure limestone consisting solely of calcium carbonate. Impurities, however, reduce the value for many limestones to 80 percent or lower, and values of 85 percent or thereabouts are common.

For comparison, consider the average slag containing 41.6 percent CaO, 6.2 MgO, and 1.39 percent of sulphur. Of this CaO, 2.42 percent has no neutralizing value because it is combined as calcium sulphide. This leaves a net effective CaO content of 39.2 percent to form, with the 6.2 percent of MgO, a calcium carbonate equivalent of 85.4 percent. Ton for ton, the average slag thus has about the same potential ability to correct soil acidity as have many (perhaps most) agricultural limestones.

For reasons that are mainly historical, *liming*, or the correction of soil acidity, is usually considered to be something distinct from *fertilization*. The latter term is used when nitrogen, phosphorous, potassium, or other plant nutrients are applied to the soil or crop foliage as a means of feeding the crop. Liming the soil always involves the addition of plant-nutrient calcium and to that extent it is a fertilization process; but the main objective is nearly always the *correction of soil acidity*. Actually, the application of calcium incidental to liming is often an important kind of fertilization, since acid soils are often deficient in that element. Calcium is supplied by slag and other liming materials in large quantities; any other additions of this element will normally be unnecessary where adequate liming is used. Smaller, but probably adequate amounts of magnesium for crop needs, even under deficiency conditions, are also supplied by slag but not by all agstones, many of which contain little or no magnesium.

The plant nutrients in slag, in

(*Continued on page* 144)

Special ladle cars haul the molten slag from furnace to cooling pits.

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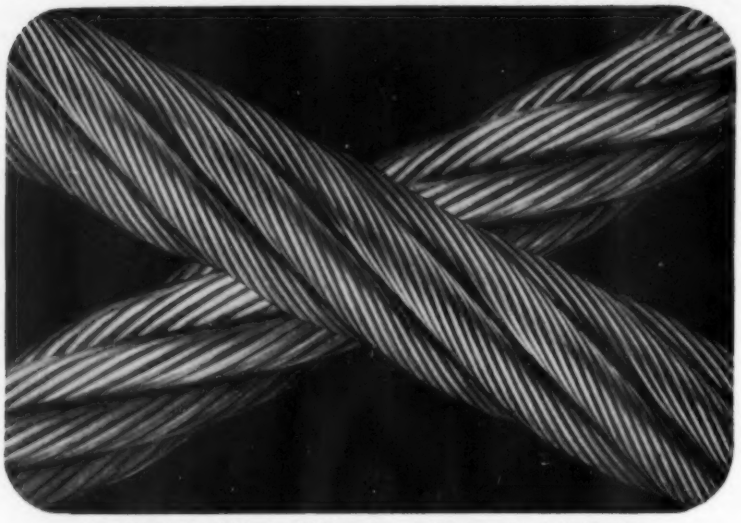

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A spreader truck distributing agricultural blast furnace slag on a farm.

Blast Furnace Slag

(*From page* 141)

addition to calcium and magnesium, may cause it to be preferred as a liming material; but slag is not likely to be purchased or used solely because it is a carrier of some nutrient, or nutrients, for example manganese, not found in such quantities in agstone. The effects and values of the nutrient and non-nutrient elements in slag should be evaluated as a liming agent.

Since liming is commonly done at rates of 2 to 6 tons per acre, relatively large amounts, even of elements present in the slag in low concentrations, may reach the soil in this manner and will make a contribution to soil fertility in addition to that due to liming. Since slag is known to decompose in the soil, all of its various plant nutrient components probably become available to crops, at least temporarily.

As a basis for discussion of the effects and values of the slag contents of manganese, boron, copper, zinc, molybdenum, sulphur and cobalt, it will be assumed that three tons per acre of slag have been applied preparatory to producing certain crops. It is impractical to attempt any general discussion that would apply to all crop and soil conditions. The examples chosen are arbitrary and should not be used too freely to draw general conclusions relative to the ability of slag to supply the needs of all crops.

Manganese in the 3 tons of slag would amount to about 40 lb. (A 1,500 lb. cotton crop—seed and lint—contains about 0.11 lb.) On manganese-deficient soils, applications of 9 to 18 lb. per acre of manganese as the sulphate have been recommended. For this and nearly all other crops, slag liming would theoretically more than supply manganese needs and correct manganese deficiencies until liming again becomes desirable. Some caution is necessary here because of the complicated effects of degree of soil acidity and other factors on manganese availability.

Boron in the slag would average about 0.72 lb., although some blast furnace slags will supply about 1.3 lb. It has been estimated that 4 tons of alfalfa hay remove about 0.25 lb., and applications of 2 to 5 lb. have been recommended to correct actual boron deficiencies. The boron in slag would thus appear to be adequate for the needs of this crop, a heavy boron feeder, and would correct moderate deficiencies for several years. (As noted later, deficiencies were actually corrected in one set of experiments).

Copper and **zinc** in the 3 tons would amount, on the average to about 0.06 lb. of each. Amounts of these two elements removed in common crops range from about 0.02 lb. of each in tomatoes to 0.06 lb. of copper removed in alfalfa and 0.29 lb. of zinc in oat straw. Taking into consideration losses by leaching, it is doubtful that slag liming would supply all the needed quantities of these elements, even where the removal in the crop was low. Truck crops on copper-deficient peat and muck soils may require applications equivalent to 20 to 200 lb. of copper sulphate, and cotton on zinc-deficient soils may require 8 to 16 lb. of zinc. Copper and zinc introduced into the soil by slag liming should supply only a part of the crop needs for such elements.

Sulphur in 3 tons of the average slag would amount to 83.4 lb. or about two to four times the sulphur removed by a 10-ton crop of cabbage, a crop whose sulphur requirement is exceptionally high. Sulphur is not often deficient. Relatively large amounts are contained in the currently used superphosphates and in most mixed fertilizers. Sulphur gases resulting from the burning of coal are largely returned to the soil in rain water and snow. The sulphur content of fertilizers is tending to decline, however, through the use of concentrated superphosphated and other phosphorus carriers which contain little or no sulphur. Slag liming will introduce important quantities of sulphur into the soil which can be used by the crop when and if needed. Few agstones contain any significant quantity of sulphur.

Cobalt and **molybdenum** were present in the slag samples analyzed by Chichilo and Whittaker in such small amounts as to be hardly worthy of notice. Cobalt could not be detected in many of the samples, and in most cases the molybdenum content was less than 0.3 p.p.m. It is the writer's opinion that the farmer should not expect any appreciable benefits from the slag contents of these elements, even when the liming rate is very high. Cobalt and molybdenium deficiencies in the United States are found only in very restricted areas.

Silicon, iron, and **aluminum** are present in nearly all soils in very large amounts. As released by the hydrolysis of slag, they are probably more readily absorbed by plants—temporarily, at least—than from the forms native to the soil. Aluminum's role in plant nutrition is still in doubt, but excesses of soluble aluminum in the soil can be toxic to crops. One of the ways liming is supposed to increase crop production is through the reduction of the solubility of soil aluminum. The reaction of slag with soil probably renders the slag aluminum quickly insoluble. No observations of aluminum toxicity from slag liming have come to hand, and it has not been shown that such liming has any effect on the aluminum content of the crop. Aluminum added in slag probably has no effects of importance, either favorable or unfavorable.

Much less iron than aluminum reaches the soil by slag liming. Iron deficiencies are rare, however, and tend to occur on calcareous soils where liming would not be practiced. On acid soils iron availability is affected by many factors, including the soil content of organic matter and manganese. As with aluminum, liming tends to reduce that availability under some conditions, but seldom to the point of creating a deficiency. Actual benefits from the iron content of slag are apt to be rare.

Silicon requires further consideration. Three tons of slag contain over a ton of the oxide (SiO_2), which is released in the soil; Hubert Kappen

(*Continued on page* 150)

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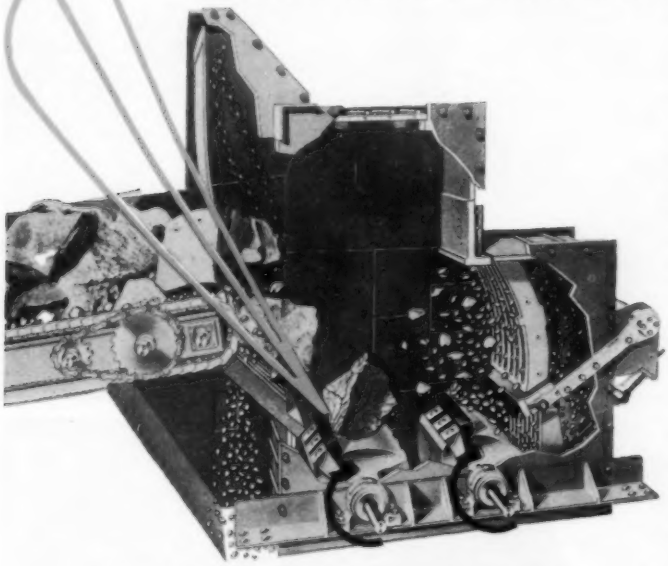

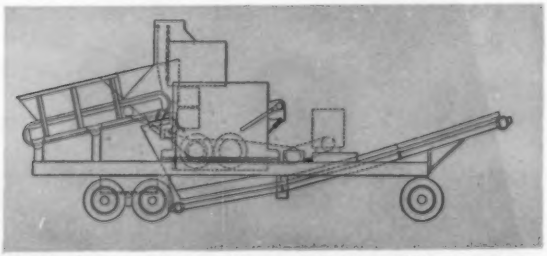

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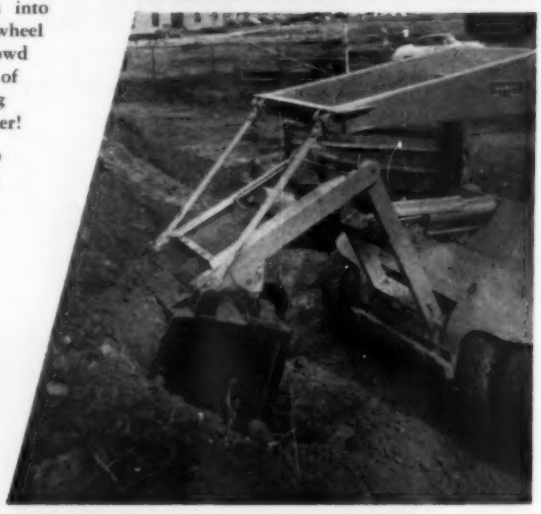

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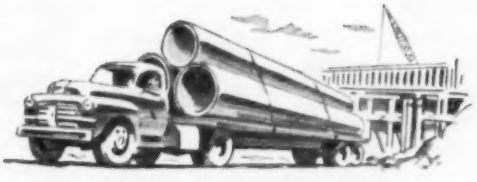

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ALLIS-CHALMERS

Blast Furnace Slag

(*From page* 144)

(5), the German scientist who spent many years studying the use of slag in agriculture, believed that slag liming increases the silicon uptake of some crops, resulting in increased resistance to lodging and to mildew. Other workers have observed that available silicon tended to increase plant resistance to parasites. Silicon is thought by some to affect the phosphorus metabolism of the plant and to assist in the release of phosphorus from soil colloids. The relation of slag liming to these various effects has not been established, but one thing is certain: slag liming puts abundant silicon where it can be used by the plant when and if needed. This may well turn out to be an effect of some importance. Silicon in agstones is small in amount and occurs, in general, in insoluble forms.

Slag Versus Limestone

So far in this article we have discussed the more scientific and theoretical aspects of slag liming. We come now to the real proof of the liming pudding, the effects of slag liming on crop yields.

Field trials comparing slag with limestone and other liming materials were made in the United States as early as 1916. Since then numerous comparisons have been made, both in the field and in the greenhouse. Results of earlier trials often seemed contradictory in that some were favorable to slag while others were unfavorable. The slags used may have differed in chemical composition from those available later, and their particle size may have been larger than that of the limestones used. Certainly this was true in some cases. Granulation of slag for agricultural use was a later development. Some of the early workers compared slag, to its disadvantage, with highly reactive precipitated calcium carbonate instead of with ground limestone. The early unfavorable results doubtless delayed the acceptance of slag by farmers; and the discovery of other outlets for slag in the interim has made the development of a market for slag in agriculture a matter of less importance to slag producers.

Today the results of many carefully conducted tests of slag as a liming material are available. Space allows consideration of only a few of these. Volk and his associates (8) at the Ohio Agricultural Experiment Station found granulated slag to be superior in yield-producing ability to either air-cooled slag or dolomitic limestone. The latter two materials were about equal. In an experiment with alfalfa, even the air-cooled slag was superior to the dolomitic limestone in all but two comparisons. Volk *et al* suggest that this may have been due to minor elements contained in the slag.

Carter and associates (1) of the Alabama Agricultural Experiment Station found that slag of the same fineness as a high-calcium limestone was as efficient as the stone when applied on an equivalent basis. On boron-deficient soils they found slag without added borax to be a better yield producer than limestone without borax, although the boron in the slag was sufficient on such soils for only one year. It is noteworthy that these favorable results were obtained in a comparison of the supposedly most rapidly acting type of limestone, the high-calcium variety, with the supposedly least active form of slag, the air-cooled variety.

George R. Smith[1] and associates of Nova Scotia Department of Agriculture have made both greenhouse and field comparisons of slag and dolomitic limestone. The field trials were on a highly practical basis, being made on actual farms by the farmers themselves, who followed instructions supplied by the Department of Agriculture. The general conclusion from these very comprehensive tests is that "blast lime," as some Canadians refer to slag, compares favorably with ground agriculture limestone as a source of lime for Nova Scotia soils. Farmers in that area are becoming increasingly interested in the use of slag for liming.

Chichilo and associates (2) of the United States Department of Agriculture, using the less active air-cooled slag, found that slag liming on a heavy loam soil produced sweet clover crops containing, percentage-wise, 2 to 4 times as much manganese, less calcium, and frequently more copper, than when an active high-calcium limestone was used. On this soil and on a sandy loam slag produced crops containing 2.5 times as much magnesium and significantly more boron. Aluminum and iron contents of the crop were unaffected within the accuracy of the tests. As judged by yield and soil pH, the slag was as effective a liming material as the limestone on the sandy loam but was slightly less effective on the heavy loam. Although neither soil was known to be deficient in any of the elements whose uptake was studied, the results are an indication that the slag manganese, boron, and copper were available to the sweet clover. Calcium and magnesium were, of course, also available, the magnesium tending to replace a part of the calcium in the plant. Zinc, cobalt, silicon, and molybdenum were not included in the study.

As this reporter sees it, granulated agricultural slag, considered strictly as a liming material, will generally be as efficacious as limestone, and even the air-cooled slag of proper particle size will perform well. In cases where minor element deficiencies play a part, slag will often prove superior to milestone. Practical farmers will, in general, consider slag as an alternate liming material, but there will be those who will find it superior for their own use because of some other effect.

Agricultural liming materials are commonly applied to the soil from a special "spreader truck" which carries the material from the plant or dealer to the farm and spreads it on the land directly. With agstone this is often a very dusty operation because of the large amounts of extremely fine material which readily blows about in the air. Agricultural slag is essentially free from such material and can be spread without raising any appreciable amount of dust other than that stirred up from the soil by the passage of the equipment over the land.

Perhaps the most common type of spreader is the "spinner", a rotating horizontal disc with radial ribs. The material is delivered to this disc near the center and thrown from it by centrifugal force. Since large particles "throw" better than small ones, such a machine, when used to spread agstone, tends to throw the larger particles to the outside of the swath and deposit finer materials near the center. Agricultural slag, because of the relative absence of finer particles, tends to be more uniformly spread by these machines than does agstone. There are, of course, other types of spreaders which convey the material in a uniform manner to either side of the truck before allowing it to drop on the soil. These spread all liming materials more uniformly.

Future of Slag in Agriculture

While avoiding the actual prediction of the future of slag in agriculture, let us take a look at some of the factors affecting that future.

In most cases where slag is used on the soil, it will be replacing limestone which the farmer can have delivered and spread on his land for

(*Continued on page* 156)

[1]Private communication.

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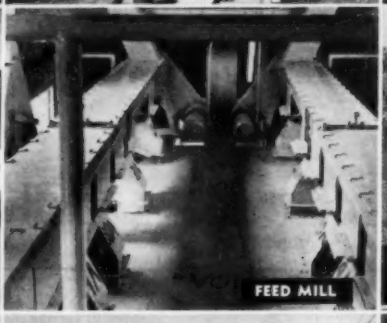
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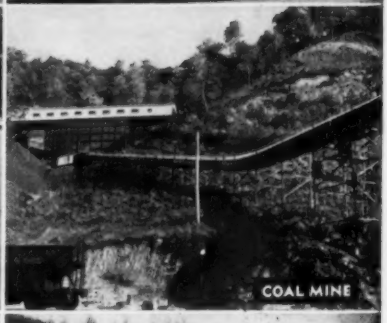
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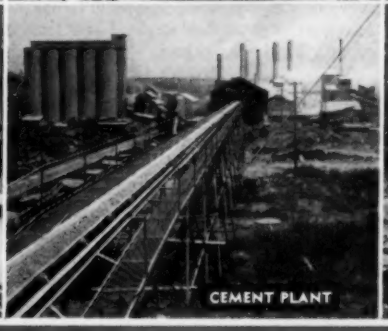
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Michigan Gravel Plant

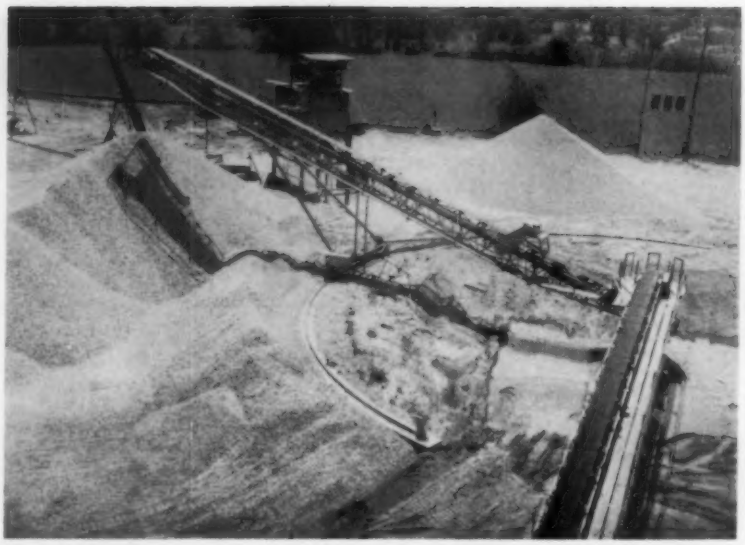
(*From page* 138)

mitting discharge from a 42-ft. elevation in a 300-degree circle. It can stockpile about 25,000 tons of material. In addition to stockpiling, this conveyor is also used to discharge any desired sizes of gravel to a rewashing plant. This consists of a Deister Machine Co. vibrating screen over a 70-ton truck loading bin.

The radial stacker is also used to feed gravel onto a 24-in. by 119½-ft. belt conveyor (No. 6), which is used to discharge crusher run material to a stockpile. About 60,000 tons can be stored in this manner.

Operation of this plant is easily controlled by men at two stations through a complete automatic sequence starting-and-stopping system. There is also a full set of controls in a ground-level switch-house. All water for the plant is supplied by a 10-in. deep-well pump. Goodyear conveyor belting is used throughout; the No. 1 and 2 conveyors are Atlas, and the others are Barber-Greene.

All deliveries from this plant are made by a fleet of 75 to 80 hired trucks. Sand is loaded into trucks by two Athey Model 125 four-speed Hi-Loaders, each of which loads at the rate of 10 tons per minute. All shipments are weighed at two scalehouses, both with Fairbanks scales. Hauls range up to 24 miles one way



The radial stacker conveyor shown stockpiling. It can also feed the rewashing screen over the truck loading bin shown.

to the company's ready-mix plants at Pioneer, Ohio, and Howe and Angola, Ind. From those plants the concrete is delivered to the turnpikes by the company's fleet of truck mixers. An important feature in the control of these widespread operations is the short-wave radio system which connects all of the plants and the main office. The cars used by the company's field staff are also equipped for radio communication.

Officers of Northwest Materials, Inc., and Southern Michigan Materials, Inc., are: Glenn J. Pierman, president; and D. N. Harman, secretary, treasurer and general manager. C. K. Cotterman is in charge of all ready-mix operations; Dale Kentner is superintendent of all operations at Pioneer; and Carl Stoy is superintendent of the Michigan plant.

Crushed Stone Directors

(*From page* 95)

talks on the use of crushed stone before various groups. The idea now is to do more along these lines, especially toward getting engineering students to know more about the proper use of crushed stone. He suggested good informative movies as the best approach to this problem, these movies to show the proper use of crushed stone following first class construction practices on various types of road bases and surfaces.

Committee Reports Wilson P. Foss III (New York Trap Rock Corp.) as chairman of the Zoning Committee, outlined several plans for cultivating neighborhood good will. It was voted to start out on a modest basis with a booklet for distribution. Whether or not more ambitious steps will be taken will depend on the results obtained with this booklet.

Harry Clark (Consumers Co.) reported briefly on the membership situation which shows a slight gain. Russell S. Rarey (Marble Cliff Quarries Co.) reported on the meeting of the N.C.S.A. and N.A.L.I. committees appointed to discuss a proposal of providing engineering service for agstone producers who also produce crushed stone. No action of any kind was taken.

Warren C. Rowe (Rowe Contracting Co.) said that much progress has been made by the committee on subrogation since he discussed this subject at the meeting a year ago. The committee is trying to correct the thinking of insurance companies which pay complainants for vibration damage and then try to collect from the quarry operators. Mr. Rowe reported that Massachuetts has revised its regulations on this subject and as a result the National Board of Underwriters is expected to come out soon with regulations to guide its adjustors. He emphasized that no permanent quarry should ever settle such claims but should fight them all.

H. H. Kirwin (Eastern Rock Products, Inc.) reporting for the Safety Committee, said that member companies doing a real safety job have cut their compensation insurance costs considerably. He suggested that the association hire a safety engineer to help members line up safety programs in their plants. It was pointed out that the direct savings alone more than pay for the cost of such a program. It was voted to refer this subject to the executive committee for possible action at the coming convention.

Manufacturers' Division The meeting of the executive committee of the Manufacturers' Division was held the morning of July 14. Chairman B. R. Maloney (E. I. du Pont de Nemours & Co.) presided and later reported to the N.C.S.A. board that plans are going ahead for the machinery exposition in February. Other members of the committee attending were: Irwin F. Deister (Deister Machine Co.); Wayne W. King (W. S. Tyler Co.); L. A. Eiben (Northern Blower Co); and R. D. Ketner (General Electric Co.). J. R. Boyd, executive secretary of N.C.S.A., represents the association on this committee. Messrs. Maloney, Deister, and Ketner are also representatives of the Division on the N.C.S.A. board of directors.

RALPH RAU was elected treasurer of the Missouri Portland Cement Company at the last meeting of the board of directors.

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Hazacord cables are tough, too. Every foot of every tiny flexible cord or heavy high-voltage cable is mold-cured to give service-proved "truck-tire" toughness and durability. Even, thorough curing guarantees a strong, compact cable assembly that adds to the remarkable strength of its components yet retains maximum workability and flexibility. This long-lived construction has made Hazacord the solution to difficult installations where other portable cables have failed after relatively short operating periods.

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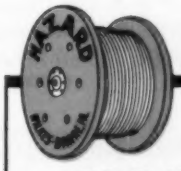

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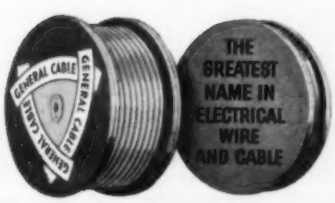

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Blast Furnace Slag

(*From page* 150)

about $3 to $8 per ton, depending upon the locality. In general this is the competition slag must meet. In the beginning, at least, few farmers will be willing to pay a premium for slag. The producer of slag, however, can readily meet the price if he wishes to do so. He must get rid of his slag. The extent to which he can sell suitably processed slag for other purposes which bring a better return will determine to what extent he is willing to process slag for agriculture.

Potential sources of agricultural slag (blast furnace operations) exist in or near Pittsburgh, Erie, Bethlehem, and Johnstown, Pa.; Youngstown and Cleveland, Ohio; Chicago; Gary, Ind.; Buffalo and Troy, N. Y.; Birmingham, Ala.; Duluth, Minn.; Houston and Dallas, Tex.; Detroit; Baltimore; Weirton, W. Va.; Fontana, Calif.; and Pueblo, Colo. Canadian sources exist at Sydney, N. S., and at Hamilton, Ont. Although they are not as widely distributed as limestone quarries, these installations, with the exception of the one at Pueblo, are in or near areas where most soils require liming for best crop production. This is important because, like limestone, slag is low in cost at the source. Main cost to the farmer will be in the transportation and spreading. Agricultural slag is now available at only a few of the above installations, but that is a situation which demand could alter readily.

Slag is widely available. Total production in 1954 was about 33,800,000 tons,[2] of which 29,200,000 tons, or about 86 percent were commercialized in various ways. Granulated slag was the favorite for agriculture, 44,405 tons were so used, compared to only 9,861 tons of the air-cooled type (6). The total used in agriculture in that year is only a small fraction of the 4,500,000 tons not commercialized. It is noteworthy that the 33,800,000 tons of slag would have supplied all the soil neutralizing power supplied by the approximately 20,000,000 tons of agricultural limestone used in 1954 without the quarrying of a single extra ton of limestone above that used in blast furnaces, and that over 4,000,000 tons of slag would have been left over. Similar relations hold for other recent years.

While, theoretically, slag could replace most of the agricultural limestone now used, economic considerations (including the cost of transporting slag into some areas in competition with limestone), and the existence of more profitable outlets for much of the slag produced will probably prevent any such development. There seems to be little reason, however, why the slag not now commercialized, plus some other not too profitably handled, might not in the future go into agriculture. It has been estimated that the roughly 20,000,000 tons of liming materials now used annually should be increased to 78,000,000 tons to maintain soil fertility and to produce maximum yields. Future expansion of the use of liming materials in which slag could well play a part, is thus a distinct possibility.

The use of slag in agriculture permits our limestone to do double duty, first releasing iron from its ores and then assisting in the growing of crops. But it does more than this. The use of slag on the land means that vast accumulations of plant nutrients, not only from limestone, but also from coke and iron ore, thus find their way into the soil, where they help feed the nation. Moreover, there is a saving in quarrying and processing costs of the equivalent amounts of limestone used directly on the soil.

Future prospects of agricultural slag can also be strongly affected by the research that remains to be done. Further data are needed on the ability of slag to supply the minor elements it contains under a variety of crop and soil conditions, especially with regard to manganese and boron. The effects of the release of active silica in the soil should also be given attention, particularly with regard to its effects on phosphorus feeding, prevention of lodging, and resistance to parasites. Many other phases could be mentioned, including the optimum particle size, etc.

[2]Unpublished estimate supplied by the National Slag Association.

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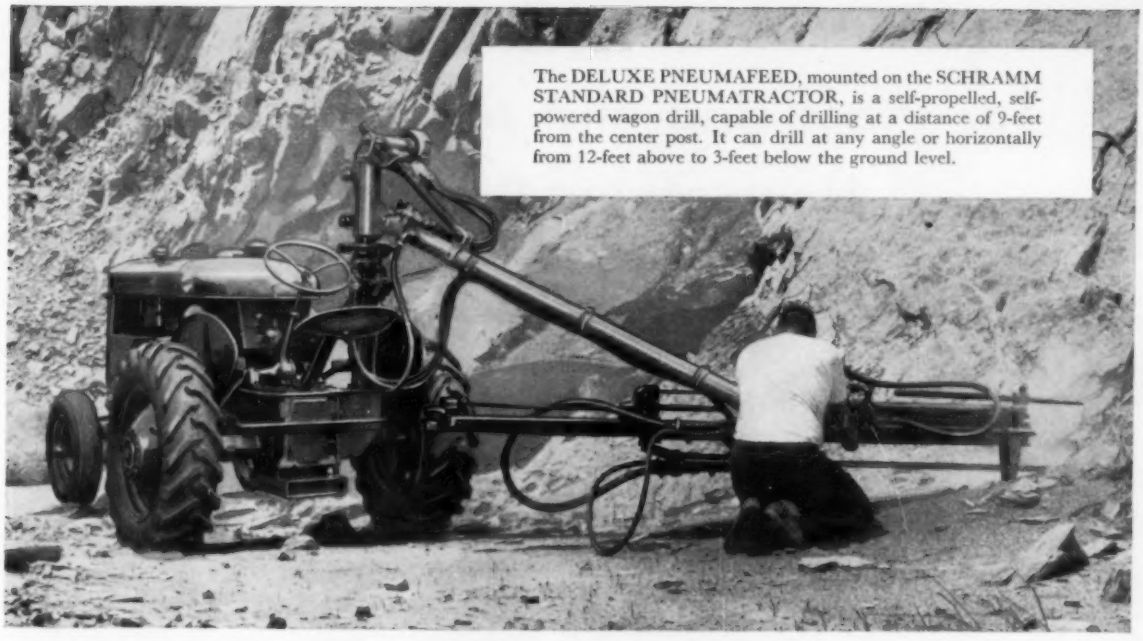
Insurance Manual Discusses Industrial Hearing Problem

With employee hearing measurement programs becoming of top importance to industry because of recent court decisions, new legislation, and a growing concern over the problem of plant and factory noise, a new booklet just published by Employers Mutuals of Wausau, titled *Guide for Industrial Audiometric Technicians,* proves both timely and informative.

The new manual is intended to furnish training and reference material for those who are learning to operate audiometers to conduct preemployment hearing measurements. Particular emphasis is placed on the techniques required in securing accurate data and the proper method of recording findings obtained from the examinations. It is based on information gathered by the insurance firm in setting up this kind of program at industrial and community levels.

Copies of the guide may be obtained, without charge, by writing to the Accident Prevention Department, Employers Mutuals of Wausau, Wausau, Wis.

The Steva Stone Company, Richmond, Mo., has opened a branch office at Carrollton, Mo. The office will supply road rock, rock phosphate, concrete rock, crushed rock, agricultural limestone, and ready-mix concrete to the area.



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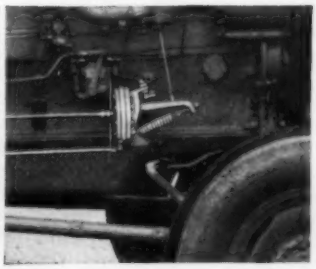
Complete details of this versatile machine are yours for the asking. Request Catalog 5545. Or ask your local Schramm dealer for a demonstration—he's listed in the Yellow Pages of your Telephone Directory.

Air motor operated screw jack, mounted on post over rear axle, raises and lowers 8-foot boom. Standard model is hand cranked.

Standard equipment for the DULUXE PNEUMAFEED includes 5-foot vertical post, 8-foot boom for carrying, raising and lowering the 7-foot air shell, boom locking clamp, built in line oiler and 45-pound drifter.



The Pneumastat, a Schramm exclusive, automatically controls the speed of the engine and compressor in accordance with air demands, saves up to 50% of fuel costs.

Write for free informative booklet, "Piston vs. Rotary Air Compressors".

Schramm, Inc.

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640 North Garfield Avenue

West Chester, Pa.

The New Law on Patents for Machines For Processing and Manufacturing Nonmetallic Products

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

DURING the writer's recent travels among manufacturers, processors, buyers, sellers, and distributors of nonmetallic products, many of these persons asked interesting questions concerning patent laws. I shall answer these various questions, generally, by explaining interesting patent law important to all readers.

Law of Infringement

Recently a reader wrote, in part, as follows: "I have read all of your various legal articles, but don't remember any on patent law. We have a law suit on our hands now, because we overhauled a patented machine. The inventor claims we owe him $12,500.00 as royalties. He contends that instead of overhauling this machine, we should have purchased a new one from him."

It is true, of course, that great and substantial financial losses may result from intentional or unintentional infringement of patents.

Many manufacturers have become involved in litigations as a result of acting on the unfounded belief that a purchaser of a patented device can without any liability make any necessary repairs of the device. The law is established, as follows: The purchaser and the user of a patented machine is liable for infringement, if he makes extensive repairs of a patented device.

For illustration, in the leading United States Court case of *Shickle v. Harris*, 77 F. 739, the higher court held:

"The rule is very well established that one who purchases a machine or mechanical contrivance covered by a patent, has the right, by virtue of his purchase from the patentee, to repair a part of the machine or device which happens to be broken through accident . . . but when a patented machine is accidentally destroyed, or when it is practically worn out, the owner . . . in such cases . . . must cast it aside and buy a new one from the patentee."

Leo T. Parker

So, therefore, in view of this leading higher court decision it is not necessary to go further into details of whether the purchaser of a patented device may be liable as an infringer, where he makes extensive repairs. He is an infringer, and fully liable as such.

What Is a Patent?

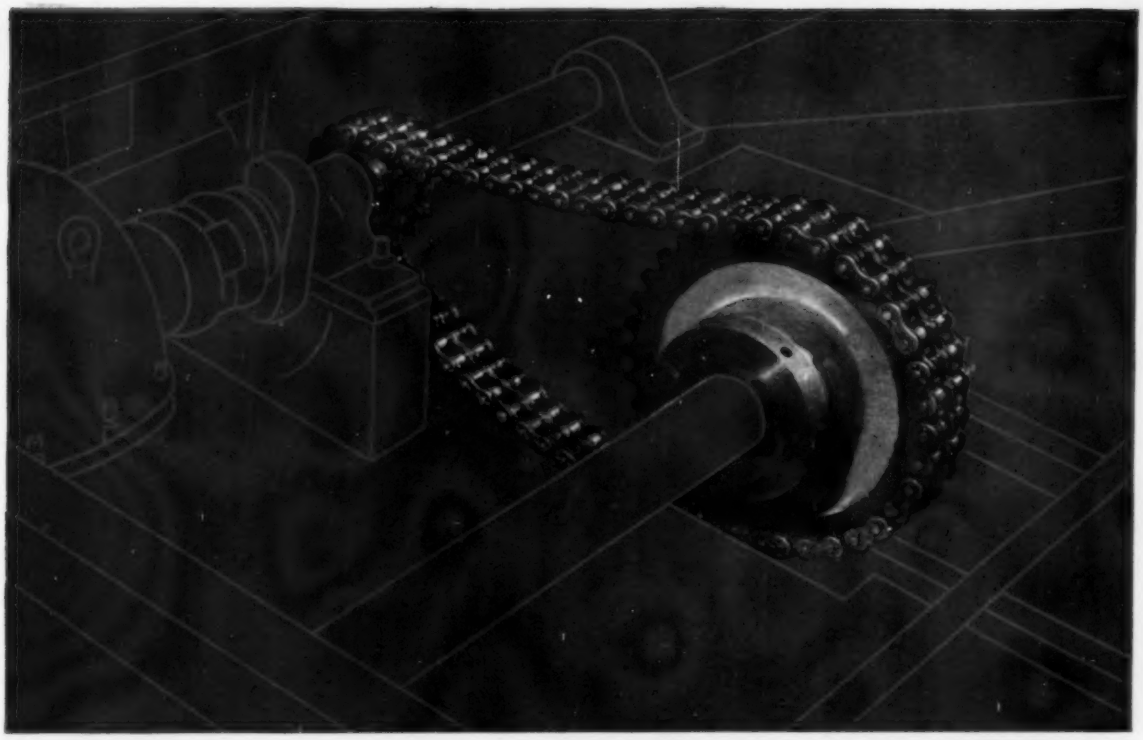
A patent is a "grant" by the United States Government giving an inventor of a new device, method, process, or compound the exclusive right for 17 years to make, sell and use the invention. After the 17 years period has expired any one can, without liability, manufacture, sell, or use the subject of the patent. Contrary to the belief of a majority of readers an inventor cannot renew a patent. Moreover, the invention must be new in the whole world, otherwise an inventor cannot obtain a United States patent. This is not the law in other countries but the United States patent laws clearly specify that no patent will issue on any invention previously used or described in any part of the world. This law is also applicable to design patents which issue for three and one-half years or more, and are limited exclusively to the ornamental exterior appearance of the invention.

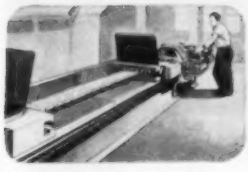
Obviously, no patent will be granted on an invention similar to a previously issued United States patent.

A few weeks ago a higher court held that in determining whether an invention is patentable, the question to be decided is whether persons skilled in art, with reference to old patents, could without exercise of inventive faculty make the combination of elements and invention.

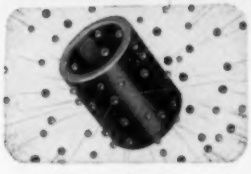
In other words, although an inventor actually invents something useful and valuable, he cannot obtain a patent if different and old patents show various parts of his invention, and by reference to these old patents a person skilled in the art and familiar with the work in which the invention is used could have made the new invention. This is so although the inventor had no knowledge of the old and prior patents.

For example, in *Carter*, 212 Fed. (2d) 189, it was shown that an inventor named Carter filed an application for a patent for a resilient joint sealing strip for tying-in slabs of concrete in the pavement of roads. A claim in the patent application described and the drawings disclosed a sealing strip comprised of an elastomeric, resilient, and tough material having a bottom edge resting on the roadbed and a top edge which shows from the surface of the concrete road as the top edge of the vertical sealing strip. Air channels are provided in the strip from end to end thereof, the channels being parallel and fitted close together so as to provide a maximum volume of air within the strip. The ends of the channels are sealed, providing a strip, which after being assembled in the road construction is air-tight and water-tight. In other words, the





PRE-STRESSING of multiple width chain provides uniform load distribution.



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LINK-BELT Precision Steel Roller Chain meets the three big requirements for lower drive and conveyor costs.

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LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

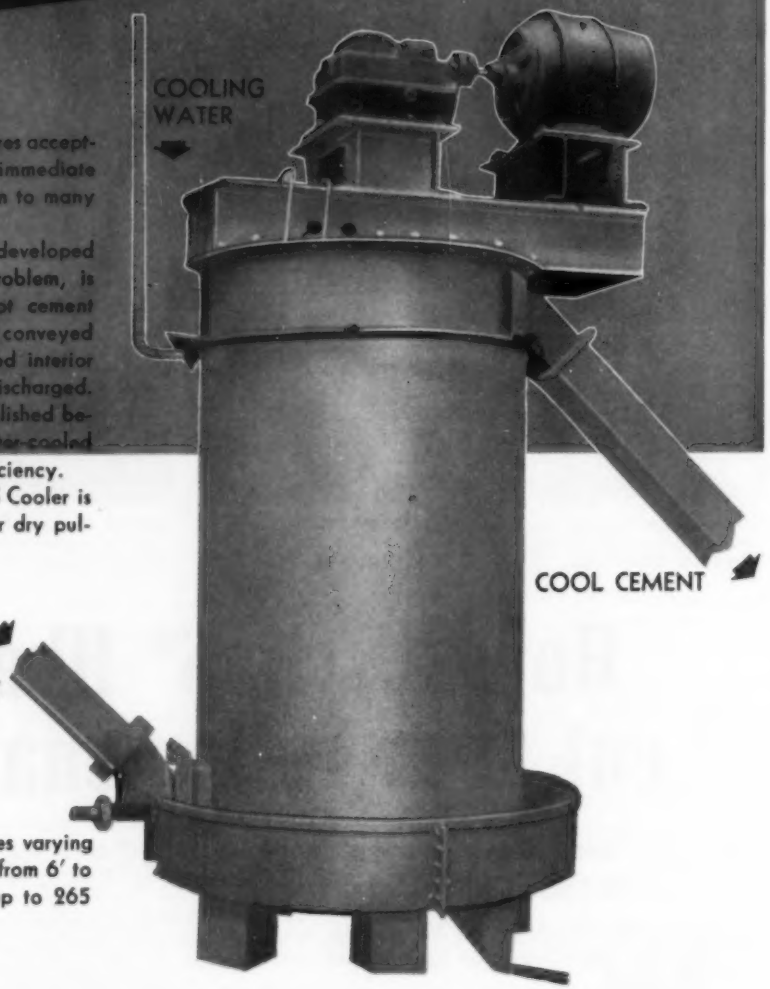
For Cooling Hot Cement

FLS

Cooling hot cement to temperatures acceptable for bulk shipment or immediate bagging is an important problem to many cement manufacturers.

The FLS Cement Cooler, developed especially to overcome this problem, is externally water-cooled, the hot cement being introduced at the base and conveyed in a thin layer along the cooled interior surface to the top, where it is discharged. Thus an intimate contact is established between the cement and the water-cooled surface, assuring high cooling efficiency.

In addition to cement, the FLS Cooler is applicable to many other similar dry pulverized materials.



FLS Coolers are furnished in sizes varying from 3′ to 6′6″ in diameter and from 6′ to 18′ in height, with capacities up to 265 barrels of cement per hour.

F. L. Smidth & Co., A/S
Vestergade 33,
Copenhagen K, Denmark

F. L. Smidth & Co.
11 West 42nd Street
New York 36, N. Y.

F. L. Smidth & Co., Ltd.,
105, Piccadilly,
London, W. 1, England

F. L. Smidth & Cie France
80 Rue Taitbout
Paris (9e) France

F. L. Smidth & Co. of Canada, Ltd.
11 West 42nd Street
New York 36, N. Y.

F. L. Smidth & Co. (Bombay) Ltd.
42 Queen's Road
Bombay, India

examiner in the Patent Office refused to issue a patent and cited prior patents, as follows: Weiss 1,628,090 May 10, 1927; Gammeter 2,071,299 Feb. 16, 1937; Fischer 2,111,113 Mar. 15, 1938; Dewhirst 2,156,681 May 2, 1939! and Fischer 2,400,493 May 21, 1946.

The United States Court of Customs and Patent Appeals refused to grant a patent, saying:

"There is no doubt that appellant (Carter) has produced a new and useful result by carrying forward features selected from the prior art and incorporating them into a single structure. Under these circumstances there is no novel combination but only an aggregation of old elements which constitutes no patentable invention. The question here is not what he did, but whether any person skilled in the art, with the references of record before him, could, without the exercise of the inventive faculty, make the combination of elements here claimed."

Better Results

Modern higher courts consistently hold that if a new invention produces better results and products can be manufactured faster and cheaper than with old devices, the inventor deserves a patent although some of the parts or elements in his machine are disclosed in patents older than his own.

For illustration, in Schutt, 210 Fed. (2d) 293, it was shown that an inventor filed an application for a patent for a "continuously cycling machine" for molding concrete blocks. Here the invention disclosed a concrete block-forming machine having a switch mechanism which is automatically operated by the drop-type platen when the desired degree of compaction of the concrete mix in the mold box is obtained.

The court allowed certain claims in the patent, and said: "Claims for a very meritorious improvement on an old machine, substantially advancing the art, are entitled to a liberal construction."

In this case the testimony showed that by use of the new invention the overall cycling speed of each machine, compared with older machines, is increased to the extent of 25 to 50 percent per minute; and that the increased productivity thus obtained results in cheaper blocks, both from the standpoint of the cost of the machine and the labor involved in the operations. Also, the testimony showed that the inventor had sold many of his machines to concrete block manufacturers who

Are your bags salesmen ?

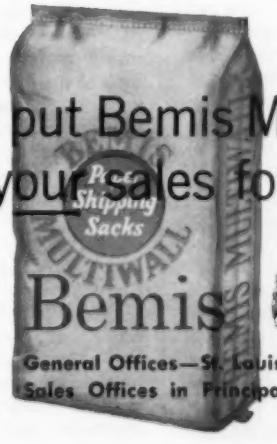
A prominent Mid-western company in the rock products field recently instructed its salesmen:

"Exploit the fact that we use Bemis Multiwall Bags 100% and capitalize on the established excellent reputation of the Bemis Bro. Bag Company for quality workmanship and materials."

We are naturally pleased by this testimonial to the quality which we constantly work to put into your bags.

Even more, we are glad to have such confirmation of a point we have often stressed:

Good, well printed bags are a real sales help!



Why not put Bemis Multiwalls on your sales force?

Bemis

General Offices—St. Louis 2, Mo.
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had discarded their old concrete block machines.

For comparison, see *Hollingsworth,* 210 Fed. (2d) 290. Here an inventor applied for a patent on an invention relating to defluorination of phosphate rock. The invention involves a two stage heat-treatment or calcination in which natural fluorapatite is subjected to two successive heat-treatments in the presence of water vapor.

In the first stage conducted at a temperature between 2,000 and 2,600 deg. F., a substantial amount of fluorine is removed from the phosphate material without materially improving its availability as a fertilizer. In the second stage, conducted at a temperature in excess of 2,500 deg. F., and preferably of at least 2,600 deg. F., we find the first calcine chemically adjusted or balanced to provide a second calcine containing from 8.5 to 14 percent silica and three mols of CaO for each mol of P_2O_5 and about two mols of CaO for each mol of SiO_2. The remaining fluorine is removed from the phosphate material and its fertilizer availability is raised to a high value. The United States Court of Customs and Patent Appeals refused to grant a patent to the inventor, saying:

"The Primary Examiner rejected all of the claims as unpatentable over either Tromel 2,093,176 or Great Britain 463,849, in view of Meriwether, in that the calcination techniques cited are within the skill of the art.

Mechanical Patent Infringement

Any person or firm who infringes a mechanical patent is liable to the patentee for full profits earned, plus all damages caused the patentee. But under no circumstance is a mechanical patent infringed unless the "claims" are infringed. The fact that the drawings are infringed does not result in liability. This rule differs from the law relating to design patent infringement, where the drawings must be infringed.

With respect to a mechanical patent, a patentee is entitled to all the practical uses of his device, and all of the functions that it will perform, whether or not he was aware of or described them while he procured his patent. (See 106 F. 693; 228 F. 691.) An inventor is not required to particularly point out and distinctively claim the different uses to which the invention may be applied, (230 F. 157) because a mechanical patent is construed, when possible, to cover the entire invention thought of by the inventor. (See 222 F. 227.)

However, a *patentee always is bound by his claims* and he cannot in an infringement suit ask for a broader construction than listed in his claims even though he may have been entitled to broader claims when the patent application was in the course of prosecution. At no time will the court expand a claim or claims in favor of a patentee, as the law is established that the inventor will be protected *only according to the terms of his claims,* and it does not matter how manifest the fact or extent of the mistake may be shown to have been in wording the claims incorrectly. And again, specifications cannot be read into the claims for the purpose of broadening them. In other words, a claim is a definition of the invention.

Each Claim Separate Patent

The rule is that each claim of a patent covers a complete invention in itself and an independent invention. (See 178 F. 552.)

The correct method for writing strong and basic claims is to have each claim specify some particular step or advantage; when a claim is poorly drawn and includes an element or part immaterial to its structure the inventor is not permitted by the court to show that the element is immaterial when attempting to make out an infringement suit. However, where all of the elements are not included in a claim, the claim is valid, although the specification or description does not explain that the element may be omitted. Therefore, the shorter the claim and fewer elements contained in a claim the better. It is more liable to be infringed by a person who attempts to copy the device.

Weak claims always are lengthy. For example, in one case it was shown that an inventor obtained a patent on vibrating screens, and more particularly to separating devices for sorting and classifying aggregates as crushed stone or gravel. Only one claim is involved. His patent contained the complicated claim, in part, as follows: "A vibrating machine comprising a base, a member to be vibrated, a plurality of leaf springs secured to said base and extending obliquely upwardly therefrom into secured engagement with said member, said springs forming a cantilever floating support for said member, a vibrating-exciting mechanism mounted on said member and forming a floating assembly therewith, said mechanism including a pair of heavy shafts eccentrically mounted for rotation in opposite directions with respect to each other and at the same speed. . . ."

A manufacturer began manufacturing and selling a similar device, except for changing the structure of the shafts. In subsequent litigation the higher court refused to hold the manufacturer liable for infringement, saying:

"On the face of the patent the defendant's (manufacturer) device does not infringe . . . (the claim) should be very narrowly construed."

Substitution of Parts

It is in favor of the inventor, when defending his patent in the courts against infringement, if he can prove that his invention is meritorious. Moreover, a person cannot avoid infringement by substituting ordinary parts.

For instance, a "pair of sprocket gears have an endless chain" may be defined in a claim, and the substitution of a pair of intermeshed gears will not avoid infringement. This is so because an inventor is protected not only against the exact part claimed, but also, he is protected against the equivalents therefore and *vice versa.* On the other hand, when the word "means" is used in a patent claim it does not broaden the claim to "any means" which may be used for that purpose, but is held strictly to what is disclosed in the drawings or specification and the equivalents thereto. (See 189 F. 61.)

Still another important point of law is that an inventor has the privilege of using words adapted to express his intended meaning, and these words have the desired meaning as intended by him and not the meaning as given in a dictionary. In other words, an inventor may not only "invent" new devices which he may patent, but also he may invent new methods and words for explaining the uses and construction of his patented device. The reason this law is established is because the courts always endeavor to afford the inventor the protection to which he is entitled. And he cannot be penalized simply because he fails to explain his invention in terms thoroughly understood by all persons.

When Patent is Infringed

Although a patent is infringed, the patentee may not always be awarded a verdict for damages. Various higher courts have held that

"Small TD-6 Does King-Sized Loader Job"

SPECIAL OPEN GRID BUCKET enables this TD-6 and Skid-Shovel to not only apply 8,500-lb. break-out force and lift loads up to 3,000 lbs., but to shake out all dirt from loads of field stones by employing action of exclusive Hydro-Spring.

50 TRUCK LOADS IN 10 HOURS is the rate this compact but powerful TD-6 INTERNATIONAL DROTT Skid-Shovel loads out field stones. Farmers have collected stones in their fields for use as riprap and spalls at a nearby dam.

North Dakota operator finds 33 HP. TD-6 INTERNATIONAL DROTT Skid-Shovel equal to next larger sized crawler with any other loader

Jerome Schriock, operator for Schriock & Sons, Elgin, North Dakota, puts it this way:

"We like this little TD-6 INTERNATIONAL DROTT *Skid-Shovel. It's small but it does a king-sized loading job—about equal to the next larger size crawler equipped with any other loader. It's faster, smoother. With the Hydro-Spring, we sure can shake the dirt out of these field rocks."*

Here are the features that prompted these remarks: break-out force of 8,500 lbs.—300% greater than similar sized loaders; 3,000-lb. lifting capacity; exclusive Skid-Shoes that apply pry-out action and transmit both loading and carrying strain into the ground—away from the loader; 47° bucket roll-back that keeps the heap on every load; ability to semi-skid loads at ground level and move them in third instead of first gear; and highest lift, farthest pitch for loading high-bodied trucks.

Call your INTERNATIONAL Industrial Power Distributor. He'll demonstrate any model you name—TD-6, TD-9, TD-14A or TD-18A equipped with ⅞, 1¼, 2 or 3 cu. yd. Skid-Shovels. See these new leaders in loaders!

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to sustain a suit for infringement, and be awarded damages and profits, the suit must be brought by the patentee within a reasonable time. For illustration, a delay of six years or less time should not bar recovery unless under special circumstances (see 271 F. 27), and a delay of three years, where the inventor was not in a position to bring suit, is not too long; but ten years delay is not reasonable under ordinary circumstances (see 160 F. 476).

Damages and Profits

No damages may be collected by a patentee before his patent is allowed but after it is allowed damages may be recovered from an infringer from the date of allowance. Therefore, anyone may make a device which is marked "Pat. Apply'd For" and not yet patented.

When the inventor files his application for a patent he may justly imprint upon his manufactured product the notifications "Patent Applied For" or "Patent Pending". In this manner he warns the public that he is endeavoring to obtain a patent. Many inventors, however, continue to imprint these notifications on their product for many years after they have been notified by the Patent Office that a patent will not be granted. Thus a majority of persons are misled into believing that the inventor has, at least, some protection against other infringing his right when, in fact, he has none.

Of course, it is very important to avoid infringement of patents. This is so because various courts have held that an infringer is liable to a patentee in an amount equal to all profits earned, plus any and all damages which may have been sustained by the patentee. And, if the infringement is intentional and wilful the damages allowed may be three times the actual damages.

Recently, a higher court laid down this dependable rule of law: A person or firm is liable for infringement of a patent under any of the following conditions: (1) if he uses it; or (2) if he makes it for his own use; or (3) if he purchases a part and combines it with other parts, which comprises an infringing device; or (4) if he conspires purposely or unintentionally with another to avoid infringement and contributes in any manner to an infringement; or (5) if he purchases and resells an infringing device, although the purchase is made believing the one from whom the purchase was made had a license from the patentee to sell or use the device; or (6) if he repairs a worn out part.

In *National v. Terre Haute,* 19 Fed. Rep. 514, the United States Court substantially held that in a suit for infringement of a patent all parties who participate in the infringement are personally liable although some are simply acting as officers or agents of a corporation. This court held that all parties who take part in infringement are liable, and that no man can retreat behind a corporation, and escape liability for that in which he actually participates. Also, this doctrine of the law has been sanctioned and enforced in *Goodyear v. Phelps,* 3 Blatchf. 91; *Poppenhusen v. Falke,* 4 Blatchf. 495; and *Iowa Barb Steel Wire Company v. Barbed Wire Company,* 30 Fed. Rep. 123.

This doctrine of law is based upon the rule that every voluntary perpetrator of a wrongful act of manufacture, use, or sale of a patented article becomes an infringer, and is legally responsible. Hence, late higher courts hold that officers, directors, and agents of a corporation are personally responsible to the patentee for infringement of his patent. In other words, any person who benefits from infringement of a patent is liable for infringement.

Actual damages for infringement of a patent may be measured by a reasonable royalty basis, or the court may decide the amount of damages by the evidence submitted, but generally the inventor must either prove the profits made by the infringer, or the net profits the inventor would have earned if the patent had not been infringed. If this cannot be done, only nominal damages are recoverable which is usually $1.00 and the costs. (See 131 F. 884; and 143 F. 894.)

If the infringement is for a patented improvement or a part of an article or machine, then only damages and profits relating to the particular part infringed may be recovered by a patentee.

The courts have repeatedly held that a pioneer or basic patent should be liberally and broadly construed in favor of the inventor, and that all subsequent devices which employ substantially the same mode of operation are infringements; but this does not mean that no other person may be permitted to use a device which performs the same function by other and different means. (See 144 F. 849.)

Still another important matter is that modern higher courts hold that an inventor may lose his right to a patent on his invention by delay in perfecting the same and delay in filing an application for a patent. However, the non-use of a patented device does not weaken the patent. In other words, the owner of a valuable patent may refuse to license its use, and in fact he can refuse to benefit the public by use of his invention during the entire 17 years' life of the patent.

In fact, a patent is the most perfect form of monopoly from which profiteering, so to speak, is legalized. This has been recognized by the courts since the early case of *Wilson v. Rausseau,* 4 Howard 646. In this case it was pointed out that a patentee has the exclusive right to make, sell, and use his invention for the term of years specified in the patent grant. Moreover, if a patentee prefers he may refuse rights to all persons and firms who desire to make, sell, and use the invention. For illustration, see the leading case of *Heaton Peninsular Company v. Eureka Company,* 47 U.S. 146. Here the Supreme Court of the United States explained that a patentee may or may not market his invention, as he sees fit.

Whom Patentee May Sue

It is important to know that the owner of a valid patent is privileged to sue for infringement either the manufacturer, seller, or user of the invention, or all of them. Thus the owner of the patent is enabled to forestall extensive infringement with little difficulty.

Modern laws classify patents as Mechanical, Process, Composition, Article of Manufacture, and Design. The four first mentioned classes of patents issue for 17 years. A Design patent is granted for three and one-half, seven or fourteen years, as the inventor specifies by making increased Government fees when the longer terms are desired.

Mechanical patents issue on purely mechanical devices. Process patents protect any method of making an old or new article, whether the process is mechanical, manual, or chemical. Composition patents are issued on things made from compositions of matter or mixtures of chemicals. Articles of Manufacture patents relate to manufactured articles which are not included in any of the former classes. Design patents relate exclusively to the external appearance of an article which must be ornamental and attractive. No mechanical functions may be protected by Design patent, and if the design of the article is to increase its effi-

Nice breakage for gneiss!

MISSION: Move a tough 20′ gneiss burden off a 69′ quarry face. Get good breakage, good displacement—but hold noise and vibration to a minimum.

METHOD: Initiate blast with ROCKMASTER® millisecond delay electric blasting caps and a combination of Giant gelatin and Apex® explosives.

Alternate pattern blast. Note excellent confinement. Toe moves out first. No wasted explosive power.

Burden moves away from face. Excellent control of throw. Minimum air blast . . . little vibration . . . no wild flying rock.

Note nice breakage and displacement. A good, workable muck pile for gneiss—tough as it is to blast.

NICE BREAKAGE for gneiss—tough as it is to blast. Muck pile perfectly spotted . . . well spread out for easy digging. Pompton Crushed Stone, Inc., does it again, as this efficient quarry at Riverdale, N. J., chalks up "another successful ROCKMASTER® blast."

An 18-hole well drill blast. 14 holes loaded in 3 decks . . . 4 holes with 4 decks each. Alternate blast initiated at bottom of holes using ROCKMASTER 25- and 50-millisecond delays. There's no wasted explosive power. Explosive force is confined—it goes to work on the rock. Noise and wild throw are virtually eliminated.

Ask your Atlas representative about ROCKMASTER—the blasting method that gives you quiet efficiency, saves explosives, and adds a "good neighbor policy" for a bonus.

BLAST DATA:

Height of face	69′
Burden	20′
Number of holes	18
Diameter of holes	9″
Depth of holes	69′
Spacing	20′
ROCKMASTER delays (alternate pattern)	2 & 3
Stemming	21′
Powder factor	3.52
Total tons stone	46,980
Total explosives	13,340 lbs.
Loading started	8:15 A.M.
Loading finished	12:30 P.M.
Blast fired	3:02 P.M.

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ATLAS EXPLOSIVES

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ciency a patent will not be allowed.

In *Cantelo*, 12 Pat. Law. R 262. the exceptionally well-written opinion of the court explains the rights of a patentee in the following language:

"The patentee has the sole right of making, using, and selling the articles, and he may prevent anybody from dealing with them at all. Inasmuch as he has the right to prevent people from using them, or dealing in them at all, he has the right to do the lesser thing, that is to say, to impose his own conditions. It does not matter how unreasonable or how absurd the conditions are."

However, after expiration of a patent the patentee loses all of his former rights, and any one may without any chance of liability make, sell, purchase, or use the invention.

A parcel of 123 acres of land near Covington, Ky., has been purchased by the Ohio Gravel Company for $168,000. It adjoins 60 acres of land which the firm purchased some time ago. Fred W. Cornuelle, company president, said the site has enough material to supply the firm's Cleves plant for the next 30 years.

Use of Hard-Facing Procedure Cuts Crusher Mantle Wear

When the Livingston Rock & Gravel Company, Inc., Long Beach, Calif., a few years back acquired the 300-t.p.h. aggregates plant formerly owned and operated by City Rock Company at Sunland, Calif., it continued to follow through on a hardfacing procedure established by the former owners.

This program involves the hardsurfacing, at approximately 24-month intervals, of the big (16,000-lb.) mantle of the plant's primary gyratory crusher. The unit is a key piece of equipment in the plant flowsheet, since it must break, at a 4½-in. setting, up to 200 t.p.h. of oversize hard river gravel, day after day.

This illustration shows the mantle after the final hardsurfacing layer has been applied.

Five years ago, extreme wear—about 4 in. in the mantle's diameter—forced a shutdown at the plant at a time when material was in critical demand. Getting a new mantle from the eastern factory could keep the plant idle for at least a month. For this reason the management decided to resort to welding in an attempt to bring the mantle back to size.

Three welders worked a total of 120 hours applying 400 lb. of Ranite "BX" hard-surfacing rod, plus 200 lb. of stainless-steel build-up. The mantle was re-installed, along with a set of new concaves, and the crusher was in operation again in the short space of five days!

Such extreme wear has not been allowed to occur since that time. At regular two-year intervals the mantle is pulled and a protective deposit of Ranite "BX" is applied. The "BX" rod, a development of Rankin Mfg. Company, Alhambra, Calif., is highly resistant to abrasive wear. Its regular use at the Sunland plant has enabled the management to keep the old crusher mantle in service long after the day it had seemed practically ready for the junk pile.

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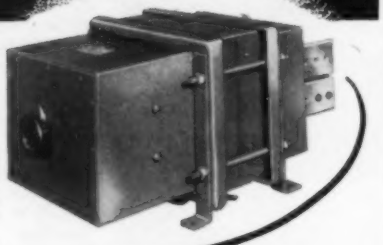

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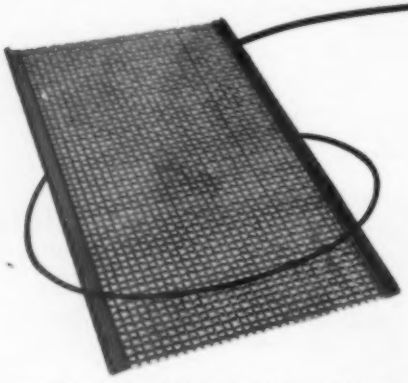
HANCO electric heaters are engineered to meet top capacity requirements for heating **all** metallic screen cloth. Mechanical abuse such as "beating" or brushing can be **eliminated completely** when you install a HANCO electric heater. Treat your screens the modern way – get HANCO.



Available in five different assemblies. HANCO engineers have designed and constructed electrical screen heaters to fit YOUR make of screen. Note: Reduction in openings can be effected to meet ever changing specifications.

LOOK AT THESE FEATURES

Faster screening—faster processing means fewer "returns".

Elimination of mechanical abuse to keep screens open.

Longer screen life — no manual cleaning increases screen life up to 800%.

Fewer shut downs for replacement of worn screens.

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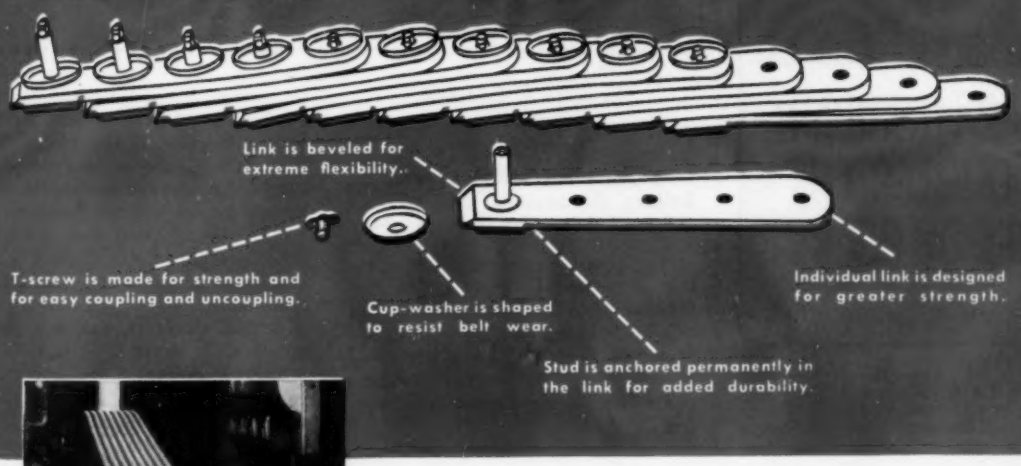
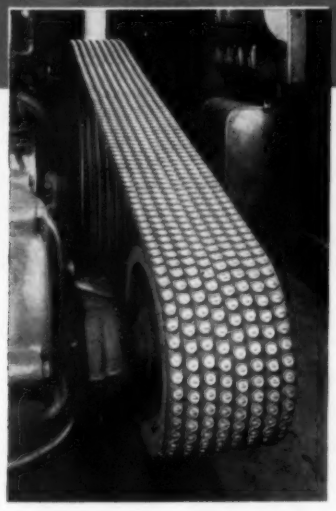
PIONEERS IN ELECTRIC SCREEN HEATING — FIRST IN THE FIELD OF LOW VOLTAGE AND HIGH AMPERAGE SCREEN HEATING

This detailed line drawing of the new, patented Veelos TD and TE v-belt makes it easy to see how this new v-belt is designed to do a better job . . . easier!


Link is beveled for extreme flexibility.
T-screw is made for strength and for easy coupling and uncoupling.
Cup-washer is shaped to resist belt wear.
Stud is anchored permanently in the link for added durability.
Individual link is designed for greater strength.



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Legal Decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Law Suits Affecting Buyers, Sellers, Processors, and Mfrs. of Nonmetallic Products

An important general legal question presented by several PIT AND QUARRY readers is: "If a buyer and seller disagree on the quantity of materials delivered to a purchaser by the seller, what is the legal procedure for solving such a legal problem?"

Last month a higher court answered this question by upholding a jury's decision after the jury had listened to all of the testimony and then rendered a reasonably fair verdict based upon the testimony. The legal solution for problems involving the quantity of materials delivered by a seller to a purchaser must be solved by a jury.

For example, in *G. P. C. Company v. R.*, 221 Fed. (2d) 317, the testimony showed facts, as follows: The cement company entered into a contract with a contractor, R., to supply a large quantity of cement to be used by the contractor in constructing a dam. The cement was shipped to R. in 1,157 cars, all of which arrived and were receipted. However, the method of computing the weight at the dam site indicated a shortage of about 12,500 barrels, the equivalent of 30 carloads of cement.

In subsequent litigation, R. proved that some of the shortage may have been caused by deposits of caked cement on top of the railroad cars, in which the cement was shipped. He also proved by engineers of the project that the cement was shipped in sealed cars which upon delivery were not reweighed by R. until converted into batches of concrete, automatically counted, each of which contained a known quantity of cement, which multiplied by the number of batches, gave the total weight, and showed a shortage of at least 6,308 barrels as compared with the amount invoiced.

The cement company contested this method by which R. showed a shortage of delivered cement and proved that in preparing shipments of cement for delivery to R. each loaded car of cement was weighed on track scales at the plant. Then the plant employee subtracted the car weight, and the net weight thereby was computed into barrels.

The jury decided that R's method of computing the number of barrels of cement received was correct, reasonable, and dependable. The jury held therefore, that the cement company delivered to R. 6,308 fewer barrels of cement than the invoices specified. The higher court approved the jury's verdict, saying:

"We think that plaintiff (R's) method of computation used to determine the shortage was clearly admissible."

Law of Contradictory Testimony

Here is another important legal question: If, during a suit involving payment for work performed by a contractor, the property owner and contractor present contradictory testimony, how will the suit be decided?

The answer is: A jury will listen to all testimony, and render a verdict based upon its belief. Last month a higher court upheld this law.

For illustration, in *Cordas v. Wright Concrete Products*, 277 Pac. (2d) 520, the testimony showed facts, as follows: A property owner named Cordas entered into a contract with the Wright Concrete Products whereby the latter agreed to form and pour a concrete slab "as per plans including the rock fill, re-enforcing steel, and 15# felt membrane for the sum of $568.80. Full payment due and payable when job is completed." Certain plans furnished provided for a binder to form tensile strength consisting of a wire mesh "6 x 6 x 8 x 8" to be laid in the slab. When the work was completed, Cordas was not satisfied. He contended that the Wright Cement Products had breached its contract, because it failed to use the 6 x 6 x 8 x 8 wire mesh. The manager of the Wright Cement Products countered this evidence and testified that before the contract was executed by the parties, they mutually agreed to the elimination of the wire mesh binder. Cordas argued and testified that at no time had he

FAST AND ACCURATE, the American 700 gets capacity loads on every pass. All actions are smoothly coordinated—and that means top production! Above, the 700 is loading one of Apex's 50 trucks used on this job with gravel from the old North Saskatchewan River bottom.

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"MOST MODERN MACHINE on the market today," says Maurice Peterson, General Superintendent of Apex, of the new American 700 Dragline. "That's the reason we selected the American to add to our capacity."

agreed to allow the contractor to eliminate the wire mesh from the plans.

The jury listened to all of the conflicting testimony and decided that Cordas had orally agreed to allow the contractor to omit the wire mesh binder. Hence, the jury rendered a verdict in favor of the Wright Cement Products. The higher court approved the verdict, and said:

"It is apparent that the contract is not clear on its face. In such cases where the words employed are of doubtful or uncertain meaning as related to the contractual obligation, extraneous evidence will be received, not to make a new contract but to discover what is, in fact, the agreement."

Decision of Land Office Is Final

Recently, the higher court rendered an important decision in a suit involving a conflict between a mining locator, who claimed rights under the general mining laws, and a lessee, who pleaded the Mineral Lands Leasing Act. The court held that since the title to the land was vested in the United States, the United States must be named as a party to the suit. Also, this higher court held that the test to be applied in determining whether a tract of land was known to be valuable for minerals named in the Mineral Leasing Act, so as to validate mining claims, is not whether an actual discovery of such minerals on the land has been made, but whether the known conditions at that time were such as would support a belief that the land contained minerals in such quantities and quality as to make extraction profitable and to justify expenditures to extract the minerals.

See *Monolith Portland Cement Company v. J. R. Gillebergh,* 277 Pac. (2d) 30, in which the court also held that a decision of the land office holding that certain claims were invalid was final and conclusive.

Contractor Is Liable

Recently a higher court held that if a contractor dumps material in a street and makes the street dangerous, he is liable for subsequent injuries to passengers who alight from vehicles.

For example, in *MacLean v. City and County of San Francisco,* 273 Pac. (2d) 698, the testimony showed that a contractor had a contract to repair a business building. While the repairs were being made, he mixed plaster by the use of both a mixing machine and a mortar box. Some of the plaster spilled on the street. When a bus approached its regular loading zone, it could not stop in a position parallel to the curb, but slanted in toward the gutter. A passenger alighted from the bus and then slipped in the plaster left on the street by the contractor. The passenger sustained severe injuries and sued both the contractor and the bus company for heavy damages. In holding the bus company not liable, the court said:

"The mere fact of stopping away from the curb but as near thereto as practicable under the circumstances, was not negligence."

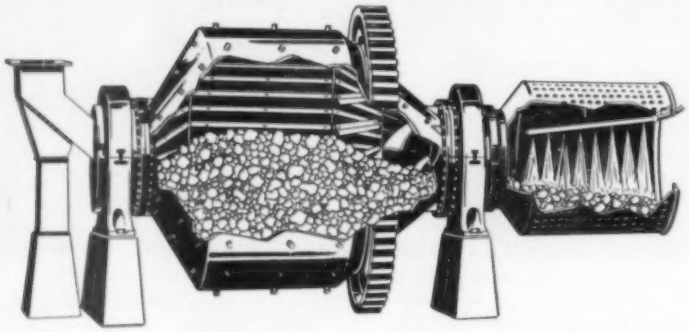
The higher court held the contractor liable in heavy damages for injuries to the passenger, and said:

"There was evidence from which the jury could have found the contractor liable for negligence in dumping material into the gutter. It was dark and very little light illuminated the area. The street there was paved, smooth, and virtually level."

Not Long Term Gain

A reader asked this question: "Can a property owner get the bene-

HARDINGE SCRUBBERS FOR PIT-RUN MATERIALS



Large diameter, short length trunnions permit chute feeding of unsized ore and rock at rates up to 600 tons per hour.
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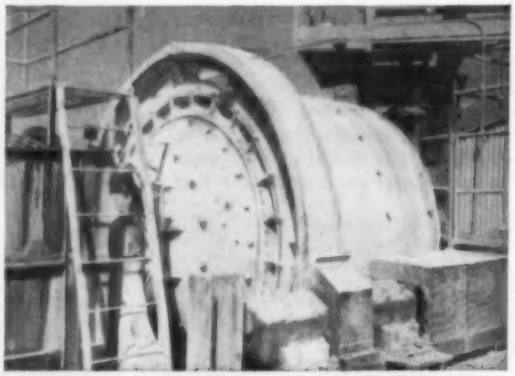
View of a 10' x 66" Hardinge Scrubber cleaning crushed dolomite in a California plant.



BULLETIN 37-A-8

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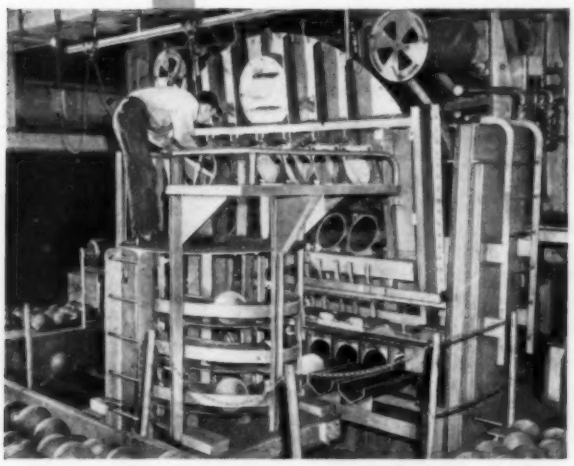

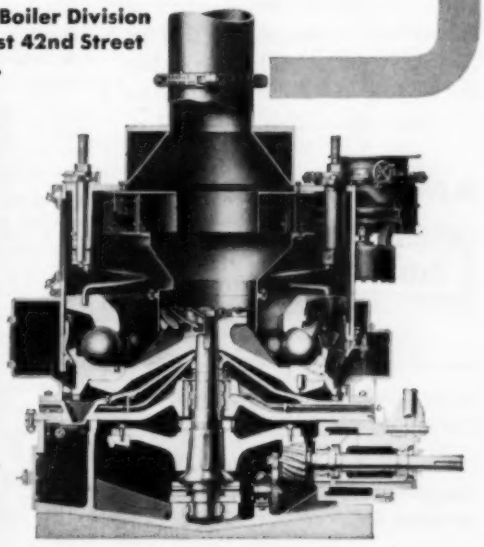

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fit of long term capital gain and pay only 50 percent federal income tax on a vacant lot which he sells at a profit? I had a vacant lot for several years which I rented as a parking lot and I sold it at $5,000 profit. Can I list this profit as a long term capital gain and pay income on only $2,500?"

The answer is: You cannot list any profit in your federal income tax return as a long term capital gain if you receive the profit from real property which you rented or ever offered for rent. On the other hand, if no effort had been made in the past to rent the property, the profit realized from its value would have been a long term capital gain.

For example, in *Assmann v. Commissioner of Internal Revenue*, 16 T. C. No. 77, it was shown that a man named Assmann inherited certain real property having a building thereon. He offered it for sale. No effort was ever made to rent the property, nor was it ever rented. A sale not at once materializing, Assman was advised by realtors that the real property would be more readily salable if the building were razed. In order to save taxes, the building was razed and efforts were renewed to sell the vacant land. Soon afterward the vacant land was sold.

In subsequent litigation, the court held that the profit realized from the sale was a long term capital gain, saying:

"The property was listed for sale, and no effort was ever made to rent, nor was it ever rented. We conclude and hold that the real property was a capital asset."

Also, see *Beck v. Commissioner*, 179 Fed. (2d) 688. Here one Beck inherited a vacant lot which was listed for sale but never for rent. Various plans were made for using the property for business purposes, but no such use eventuated. The United States Court of Appeals held the profits realized from sale were long term capital assets and said:

"It is evident that the taxpayers were not engaged in trade or business in which the real estate was used; they never appropriated the lot to the trade or business of developing property. Actually, it was not put to any use, for it was vacant and unimproved."

Weather Conditions at Seller's Plant

Another reader asked this question: "If a buyer orders delivery of merchandise postponed because the weather is unfavorable, is the

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seller bound by such notification?"

Last month a higher court rendered an important decision holding that weather conditions at a seller's plant are presumed to exist at other places where deliveries of materials are to be made, and that the seller may act accordingly.

For example, in *McKnight v. Garrison,* 261 S. W. (2d) 794, it was disclosed that a contractor ordered ready-mixed concrete to build a scale deck where cotton was weighed at a town named Crawford. The repair work was in the open. When the first truck was unloaded rain began falling, interfering materially with the work. The contractor told the driver not to bring the second load "until it stopped raining". It was not raining at the seller's plant in Memphis when the second truckload of ready-mix started the journey to the contractor's job at Crawford. However, it was at this same time raining at the contractor's job when the truck arrived. The contractor refused to accept the concrete, which was returned to the seller's plant 12 miles distant. The concrete spoiled after the return journey before it could be used.

In subsequent litigation the higher court held the contractor liable for payment for the spoiled concrete, and said:

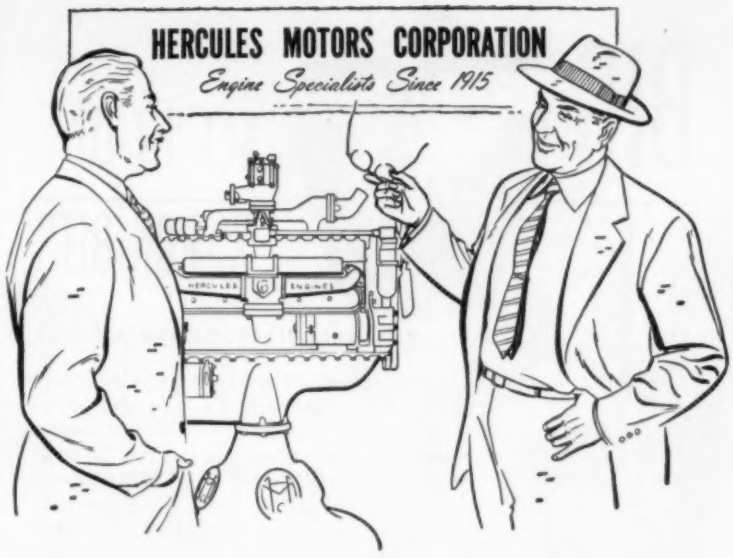
"It was not raining at the plant when the second load was dispatched. Crawford is but 11 or 12 miles from Memphis, and the seller had a right to assume that the same conditions prevailed at each place. We think, also, that after receiving the message relating to rain Garrison (seller) had a right to assume that with cessation in Memphis the way was clear for the delivery at Crawford."

What Is a Nuisance?

Another reader asked this question: "When is operation of a quarry a legal nuisance that can be stopped by nearby property owners?"

In the leading case of *Jones v. Kelley Company,* 18 S. W. (2d) 356, it was disclosed that a rock quarry and crushers are located and operated within the corporation limits of a city. A property owner filed suit asking the court for a permanent injunction against its operations because it created considerable noise and dirt, and small rocks were hurled quite a distance.

However, the lower court held that the quarry owner may continue to operate the plant if the noise and dirt incident to the operation and



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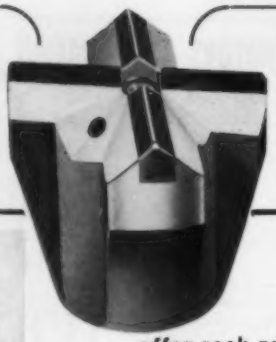
BIG  ALL-IN-ONE

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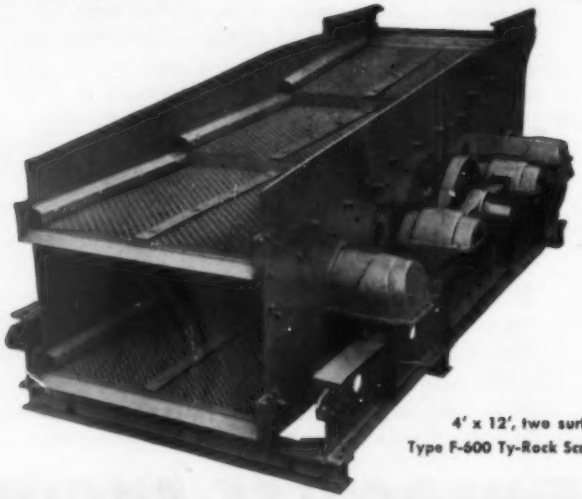

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Type F-600 Ty-Rock Screen

THE W. S. TYLER COMPANY

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the danger of hurling rocks were reduced so as to safeguard the property owners and their families living nearby.

It is interesting to observe that the higher court upheld the lower court's decision, thus merely restricting the operation of the quarry. This court explained important law, as follows:

"Operating a quarry and rock crusher may or may not be unlawful, depending upon the circumstances in each particular case. What might be a nuisance done in one place would not necessarily be a nuisance done in a different place. The locality is to be considered in determining whether there is a nuisance, although it is not conclusive, but it is to be considered in connection with all circumstances in the case. There are some nuisances in which the act complained of may be wrongful, but constitutes a nuisance only by reason of its location; and there may be an act or condition that is rightful, or even necessary, but may become a nuisance by reason of its location. What might be a nuisance in one locality might not be so in another. A business which might be perfectly proper in a business or manufacturing neighborhood may be a nuisance when carried on in a residential district; and, conversely, a business which might well be considered a nuisance in a residential portion of a city or village may be proof against complaint when conducted in a business or manufacturing locality. . ."

Not Legal Negligence

Another reader asked this question: "If a person comes on my property as a trespasser and finds dynamite which explodes due to his ignorance, am I liable?"

Generally speaking, the answer to this question is no, if the trespasser is an adult.

For example, in the leading case of *Kennedy v. Independent Quarry & Construction Company,* 291 S. W. 475, it was shown that a man (an adult) trespassed on quarry property, removed his clothes, and went swimming. Later he found a tin box which contained a number of dynamite caps. The man took out a few of the caps and put them into his pocket. Sometime later the man decided to explode the caps. He was seriously injured.

In subsequent litigation the higher court held the company not liable for injuries to the man, and said:

"It may be stated as a general principle of law that one who has

Two Mack B42's . . . part of the sixteen-unit fleet of the Allen's Ready Mix Concrete Company, Memphis, Tenn.

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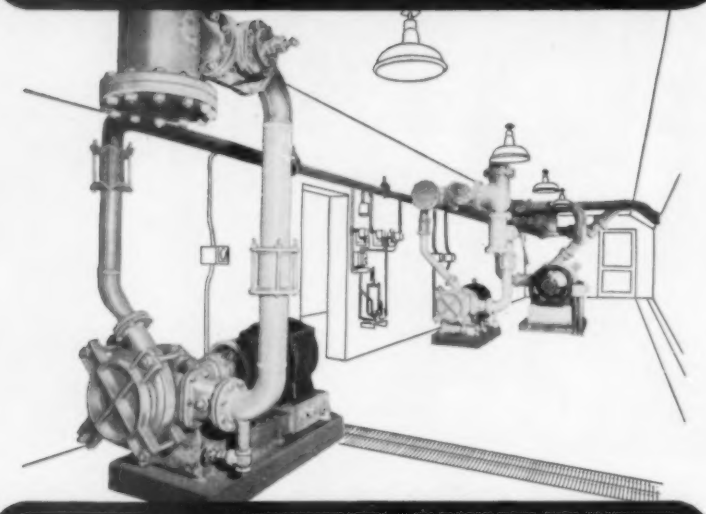
As Mr. Allen puts it, "Macks have made an important contribution to the success of my business. In my opinion, Macks are the finest equipment ever built. They have no equals for long life, dependable service, minimum down time and low-cost operation."

High praise for Mack performance? You bet! But ask other owners and operators of Macks throughout the country and see how they agree with Mr. Allen. It's no wonder that in the construction industry the "word" is—it pays to standardize on Macks.

MACK TRUCKS Empire State Building, New York 1, N. Y. 3357

Handles extremely thick slurries with high specific gravities



MORRIS Type R SLURRY PUMP

Heavy viscous slurries with solids ratios as high as 70% by weight are not unusual loads for a Morris Type R Slurry Pump.

A case in point is this Morris installation at the Missouri Portland Cement Co., St. Louis, Mo. The two Morris 3R Pumps in the foreground each handle 200 GPM of a cement slurry at 64% solids with 1.66 specific gravity. Speed is 1180 RPM. The 6R Pump in the background handles 600 GPM of the same slurry at 880 RPM.

Long operating life... little or no maintenance

Massive running parts of the Type R compensate for the increased load imposed by high specific gravities. Hydraulic passages are deliberately designed for high concentrations of solids—the result of careful study of wear patterns shown by pumps in the field handling all kinds of abrasive materials. Elimination of areas of throttling and turbulence assures uniform wear of all parts.

There are no internal studs or bolts—no troublesome internal joints and fits. The suction disc liner is merely *clamped* into position between disc and shell. The absence of high stress on the shell permits wide variations in its composition—including materials of high abrasive resistance—to resist wear and extend the operating life of the pump.

Let our engineers consult with you on your slurry pump problems. They'll give you the benefit of 88 years of pump-building experience. Or write for Bulletin 181.

MORRIS MACHINE WORKS
Baldwinsville, New York
Sales Offices in Principal Cities

MORRIS *Centrifugal Pumps*

in his possession or under his control an instrumentality dangerous in character, is bound to take exceptional precautions . . . but the caps were in a closed box, and his testimony shows he (the trespasser) knew he was appropriating something which belonged to another, and which he had no right to take."

This court also explained that the owner of a quarry, or other real property, never is liable in damages for injuries to a trespassing adult, unless the testimony shows that the adult was injured through gross negligence or intentionally by the owner of the trespassed property. On the other hand, this is not the law with respect to children. A property owner always is liable for injuries to children, who are trespassers, if the testimony shows that the property owner or his employees knew that children usually trespassed or played on the premises, and the thing that caused the injury was left unguarded or was in an exposed location.

New Law of Independent Contractor

Recently I received several inquiries pertaining to the law of independent contractors. A leading higher court decision answers these questions by holding that an employer who employs a person to work as an "independent contractor" is not liable in damages for injuries caused by such employee, nor for injuries sustained by the employee, nor for payment of Social Security, Unemployment Compensation, and like taxes. This court also explained that an independent contractor is one (1) who does work and produces results with his own equipment and according to his own means and methods; (2) who furnishes a part or all of the material for doing the work; (3) who is paid either a gross sum of money for a job or by piece work; (4) and who is under no obligation to work exclusively for one particular employer, or at any particular time.

See *Corder v. Morgan Company*, 166 S. W. (2d) 455. Here it was shown that an employee was paid for his work by the hour. Other men on the job were under his control, and he kept records and made reports regarding these employees to his employer.

In subsequent litigation the employee contended that he was an independent contractor, because he had no regular working hours. The higher court promptly held that he is not an independent contractor,

because his employer paid him hourly wages.

This court went on to explain that an employee is an independent contractor only when he works independently of control by his employer, when he is on a job payment basis, and when the employer does not furnish tools, equipment or motor trucks to enable the employee to do his work or complete his contract.

"As Is" Contract

A legal question of considerable importance to buyers, sellers, and producers of nonmetallic products relates to "as is" contracts. Generally speaking, an "as is" clause in a sale contract relieves the seller from any and all implied and expressed guarantees. In fact, an "as is" clause in a contract invalidates both an expressed and implied guarantee.

For illustration, in *John v. Waisman Bros.*, 36 Atl. (2d) 634, the testimony disclosed that a dealer sold a used machine to an excavation contractor for a small price. The written contract between the dealer and the contractor contained a clause that the machine was being sold "as is". Later the contractor sued the dealer for damages based upon the profits he would have earned on a job if the machine had not broken down. The higher court refused to hold the dealer liable, and said:

"The seller sold it 'as is', and this term, when contained in a memorandum of purchase and sale, means that the seller sells and the purchaser buys the specified chattel in its then existing physical and mechanical condition and without warranty as to quality or fitness for a particular purpose."

New Mexican Cement Plant Produces 50-60 Tons Daily

A new cement plant, the Cementos Maya, S.A. was completed in March, 1955, and has an initial capacity of from 50 to 60 tons a day. Fifty workers, in addition to truck drivers and others who work on a contract basis, are employed.

The new plant, which had cost 4,000,000 pesos by the end of 1954, (1 peso equals US$0.08) is large enough to accommodate additional equipment, which would double its output should the demand be great enough. Cementos Maya expects to operate at a profit by selling at 15 percent less than the current rate of 280.00 pesos a ton charged for cement brought in from other parts of Mexico.

Manufacturers' News

The purchase of Ottawa Steel, Inc., of Ottawa, Kan., manufacturer of roadbuilding and industrial construction machinery, has been announced by L. A. Young Spring & Wire Corp.

L. A. Young Spring & Wire Corp., manufacturer of related wire products and a major automotive parts supplier, operates 16 plants throughout the United States and Canada. Edwin L. Johnson, has been appointed general manager of Ottawa Steel Division.

Promotion of eight executives of the sales organization and formation of new divisions have been announced by The Torrington Co., Torrington, Conn. The promotions are:

Donald E. Lewis to be sales manager, Bearings Division at Torrington; Raymond G. O'Connell to be assistant sales manager, Bearings Division; Richard A. Ramsay to be manager of Torrington's Detroit, Mich., office; Clarence H. Rowe to be sales manager, Needle Division; C. Raymond Johnson to be assistant sales manager, Needle Division; Wesley B. Meeteer to be manager, Torrington Needle Office, Chicago, Ill.

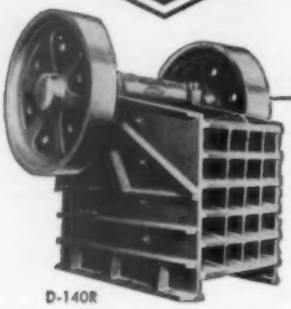
The three new divisions will be Swaging Machines, Surgical Needles and Specialties (precision metal parts).

Neff Machinery, Inc., Miami, Fla., has been appointed the distributor in southern Florida for the Continuflo line of mineral and aggregate processing equipment and bituminous mixing plants manufactured by Pioneer Engineering Works, Inc., Minneapolis, Minn., subsidiary of Poor & Co., Chicago, Ill.

STOP!
TOO FREQUENT SHUTDOWNS
Buy WIRE SCREENS THAT
SERVE LONGER — STAY STRONGER
CLEVELAND
WIRE SCREENS
... maintain rigid accuracy of openings.
... provide longer productive service.
... are accurately woven of tough, yet ductile abrasion-resistant steel.
... increase your profits.
Send us your job requirements — our specialists are at your service.
THE CLEVELAND WIRE CLOTH & MFG. CO.
3576 E. 79 STREET · CLEVELAND 5, OHIO

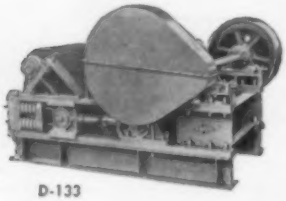
DIAMOND

Serves Every Aggregate Producing Need


D-140R

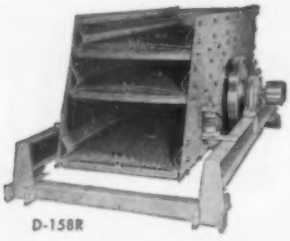
JAW CRUSHERS

Aggregate producing ability, strength and economical maintenance are included in Diamond's exclusive design. Its long, deep jaws and flat crushing angle handles the hardest rock with minimum effort. Jaws are manganese steel and reversible for extra service life. 11 sizes. Capacities 1½ to 500 tons per hour. CATALOG 600


D-133

ROLL CRUSHERS

A perfect finishing crusher, equipped with special bearings and drive arrangement to relieve stresses. Features floating roll and safety spring releases. Six sizes. Capacities 10 to 200 tons per hour. Chain or Star Gear Drive. CATALOG D-5413


D-158R

VIBRATING SCREENS

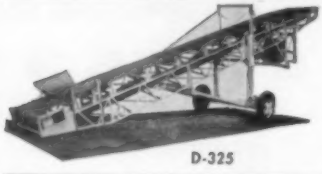
Scalping and Scrubbing Screens Drag Washers

A Diamond balanced vibrator cannot be choked. There is generous room between decks. The vibrating action is evenly distributed to every part of the screening area. Fast, easy flow of material with a thorough separation job is normal performance for Diamond screens. Ask for Catalog D-5412, which also describes Scalping and Scrubbing Screens as well as Drag Washers.

D-155

FEEDERS, BINS, HOPPERS

Apron and Plate Feeders, Grizzlies, Storage Bins—a complete line and range of sizes are described in CATALOG D-101


D-325

CONVEYORS

Sectional Steel Conveyors—three featured styles. Bucket elevators, Conveyor Rolls, Belt Conveyors. Stationary conveyor systems built and installed to suit every requirement and condition of service. All described in CATALOG D-5416.

There's no cost or obligation for these informative catalogs. Send today for the ones that will be helpful to you. And if you want additional data, ask the Diamond distributor in your district.

DIAMOND IRON WORKS

DIVISION **GOODMAN** MANUFACTURING COMPANY

HALSTED STREET AND 48th PLACE • CHICAGO 1, ILLINOIS

Rock, Sand and Gravel Crushing, Screening, Washing and Conveying Equipment—Portable and Stationary Plants

Gordon Weller, former public relations director for western operations, has been named advertising manager of Climax Molybdenum Co., New York, N. Y.

Mr. Weller, who joined Climax in 1953, is taking over his new position at the New York office of Climax and will be succeeded at Climax, Colo., by Donald Stephens, who, up to this time, had been associated with Mr. Weller's department.

Worthington Corp., Harrison, N. J. has purchased from The Elliott Co., the fifteen acre factory site formerly owned by Crocker-Wheeler Electric Mfg. Co., in the Ampere Section of East Orange, and Newark, N. J.

According to Walther H. Feldmann, executive vice-president of Worthington Corp., the acquisition will be used to partially accommodate two of his company's major product divisions: the manufacture of large central station air conditioning equipment; and the manufacture of standard pumps.

The headquarters offices for engineering, sales, and service for Worthington's Air Conditioning and Refrigeration Division will be moved to the Ampere site from the present location at Harrison, N. J., and will continue to be under the direction of M. M. Lawler, vice-president in charge of that division, at the new location.

Worthington's Standard Pump Division will continue to be headed by V. de P. Gerbereux, general manager of the Standard Pump Division, who will eventually make his headquarters at the Ampere site, along with his engineering, sales and service staffs.

Fire in the main offices of Columbia Machine, Vancouver, Wash., destroyed a quantity of office equipment, business literature and correspondence the night of August 2, according to Walter Neth, sales manager.

Unaffected were the main assembly plant, machine tool and engineering departments. The company's files of designs and blueprints were not touched.

Permanent records in steel files, desks and safe came through in good shape, Neth said, but many papers currently being processed were lost. He asked the firm's correspondents to be patient, and to make inquiry if answers to recent letters are not received promptly.

In this kit is the answer to all your conveyor belt needs!

THE LID'S OFF!

Now, for the first time, you can see in miniature a conveyor belt designed to your exact specifications... built right before your eyes... in only a few minutes of your time, on just a few inches of desk space. And this "U. S." Conveyor Belt Construction Kit can save your company countless hours, thousands of dollars of expense.

Completely new and exclusive with "U. S.", the Kit removes all uncertainty about the right belt for the specific job. Every type of materials handling problem, every kind of operating condition is taken into account. You see exactly how your conveyor belt must be constructed for highest output at lowest cost and long operating life.

Whether or not your present system has been giving you good service, you owe it to yourself to look into this unique and comprehensive analysis of your conveyor belt needs.

Absolutely free—no obligation whatsoever. It is strictly a service of United States Rubber Company. A "U. S." Sales Engineer will contact you in the near future. Or better still, why don't you call any one of the 27 "U. S." District Sales Offices and set up an appointment to see this remarkable new method of analyzing your conveyor belt requirements?

"U. S." Research perfects it..."U. S." Production builds it... U. S. Industry depends on it.

UNITED STATES RUBBER COMPANY
MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER • NEW YORK 20, N. Y.

Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

720 TONS . . . AN HOUR'S HAUL WITH THIS
SAUERMAN TOWER EXCAVATOR

Pioneer's giant excavator is the largest power scraper installation in the sand and gravel industry.

Pioneer Sand and Gravel Co., Seattle, Wash., needs a huge flow of material to supply its ready-mix plants and barges. They're getting it with a 12-cu. yd. Crescent Scraper.

The Crescent handles 480 yds. or 720 tons per hr. over an average haul from 300 to 350 ft. It operates along a 675-ft. span between movable head and tail towers located at the base and top of the 240-ft. high bank.

In addition to high rate of delivery, adoption of the Sauerman Method provides two other advantages over the 5-cu. yd. power shovel that formerly operated off the "toe" of the bank. These are: (1) material can now be taken from anywhere on the bank for blending and selection of gravel, and (2) material can be moved down the slope with no danger of cave-ins.

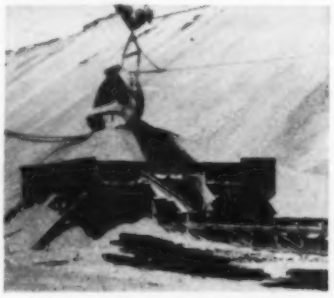
The tower excavator at Pioneer is mounted on portable towers and engineered by Sauerman for economical excavation in this type of deposit. This same digging tool . . . the Crescent scraper . . . can be engineered to your operation to give you equivalent high production at low cost.

Sauerman Scrapers range from ½ cu. yds. up to 18 cu. yds.

Because in most cases it is cheaper to drag material than it is to lift and transport it, *they give you the lowest cost per cu. yd. handled.*

Contact us for information and specific recommendations. Ask for field reports and Catalog A.

This view gives some conception of the height and steepness of the bank on which the Crescent works.



The Crescent delivers to a portable field hopper from which belt conveyors transport the material to the plant.

SAUERMAN BROS. INC.

634 S. 28th AVE. BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

Hewitt-Robins Inc., Stamford, Conn., manufacturer of rubber and machinery products, plans to acquire the business, manufacturing facilities and assets of the W. A. Jones Foundry and Machine Co., Chicago, Ill., maker of heavy-duty speed reducers, pulleys, gears and other accessories used to drive machinery. An agreement covering the terms of purchase has been signed by the two companies and the transfer is expected to take place August 31.

The new acquisition will be operated as the Jones Machinery Division of Hewitt-Robins. Thomas A. Jones, president of the present company, will join Hewitt-Robins and be manager of operations of the Chicago plant, and all other operating and distribution personnel will also become associated with Hewitt-Robins.

Stockholders of Hercules Steel Products Corp., and Central Ohio Steel Products Co., have voted to approve the proposed merger of the two firms. The new company will be known as Hercules Galion Products, Inc.

David Van Alstyne, Jr., former Hercules board chairman, will be chairman of the new company. E. Paul Monroe will be president and Oliver C. Henkel, senior vice-president. Other officers will be Alfred Dangler, Jr., executive vice-president and J. Robert Melish, secretary and treasurer.

Atlas Truck Equipment & Bus Co., 126 S. Second St., Milwaukee, Wis., have been appointed as distributors of Galion Allsteel hydraulic hoists and dump bodies, according to an announcement by Galion Allsteel Body Co., Galion, Ohio. All of Wisconsin and the Upper Peninsula of Michigan will be covered by this distributor.

Two distributor appointments are announced by Baldwin-Lima-Hamilton Corp., Construction Equipment Division, Lima, Ohio.

General Machinery Corp., 1227 Marietta St., Northwest, P.O. Box 196, Station D, Atlanta, Ga., has been named distributor covering the northern portion of Georgia with the exception of five extreme northwestern counties.

Aldridge-Harbour Equipment Co., Inc., Highway 80, West, P.O. Box 2564, West Jackson Station, Jackson, Miss., has been assigned the southern half of Mississippi. Aldridge-Harbour is also distributor for Austin-Western crushing equipment.

WHICH TRUCK LASTS LONGER?

CORROSION spreads rapidly when paint was scratched, exposing untreated sheet metal.

DURIDIZED panel which got the same scratch shows how corrosion was prevented from spreading.

AUTOCAR, of course, with Heavy Gage Duridized Sheet Metal

Here's Why AUTOCARS Last and Last

Autocar sheet metal gets the special duridizing treatment in the modern, new Autocar plant at Exton, Pa. Then painted surfaces are baked in the infra-red ovens. To show what this means to Autocar life, special weathering tests conducted by Autocar engineers dramatically prove the superiority. The sheet metal panels shown above were painted under identical conditions and scratches made through the baked paint films into the base metal. The panels were then exposed to the elements. The results tell the long life story.

COMPARE these features, and you'll pick Autocar every time!

It's heavier-gage sheet metal than used on most other makes, but, more than that, there is extra care given Autocar sheet metal because of the *duridizing* process that produces on the cleaned metal surface a thin, hard chemical coating that increases paint life . . . resists corrosion and wear . . . provides a firm anchor for baked-on paint.

AUTOCAR TRUCKS

AUTOCAR DIVISION OF THE WHITE MOTOR COMPANY, EXTON, PA.

SEND ME FACTS THAT PROVE AUTOCAR LONG LIFE

AUTOCAR DIVISION, The White Motor Company
Exton, Pennsylvania

Please send me copy of new Autocar Facts Book

Name _____

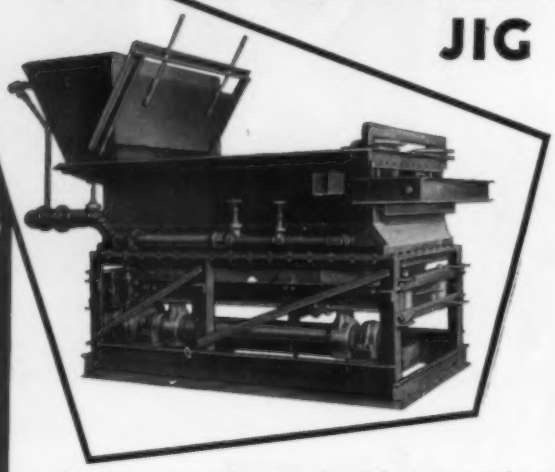
Position _____

Firm _____

City _____ Zone ____ State _____

24-J

THE MECKUM SAND AND GRAVEL JIG



REMOVES

WOOD
LIGNITE
OCHRE
SHALE
POROUS STONE
SOFT STONE
COAL
CHERT
CLAY

Improve your sand or gravel specifications at a low cost per ton. Of compact design, the Meckum Jig separates low from high specific gravity materials with a positive water and mechanical action.

Write us for details or nearest installation.

MECKUM ENGINEERING, INC.

53 W. Jackson Blvd., Chicago 4, Ill. Dayton Road, Ottawa, Ill.

✓ . . . check the advantages

for the

"Cape Ann" FORGED

STEEL DROP BALL

- ✓ SPECIALLY DESIGNED
- ✓ GREATER IMPACT
- ✓ ECONOMICAL

2000 to 12000 lbs.

Budget-minded quarrymen specify the "Cape Ann" Drop Ball to insure record rock-breaking efficiency. Equipped with a forged connecting link, protected by a deep recess, adaptable for swivel or shackle. Strong alloy steel pin. Low cable replacements. Furnished complete as shown.

Write Today for full details

Cape Ann Anchor & Forge Co.

Gloucester • Massachusetts

Robert J. Sudlow has been appointed district representative for the New England states by The Frank G. Hough Co., Libertyville, Ill. Hough distributors whom he will assist with the sale and servicing of the *PAYLOADER* line of tractor-shovels and tractors are: Clyde Everett Equipment Co., at Burlington, Mass. and East Providence, R. I.; Graves Equipment Co. at Northampton, Mass. and Burlington Vt.; R. C. Hazelton Co., at Manchester, N. H.; Wilhelm-Davies, Inc. at Wallingford, Conn.

Robert J. Sudlow

Ralph E. Forsman

Ralph E. Forsman has been appointed to the sales staff of Basic Refractories, Inc., Cleveland, Ohio. He will be located in the Philadelphia office to meet demands of the steel industry in that area for granular basic refractories manufactured by the firm.

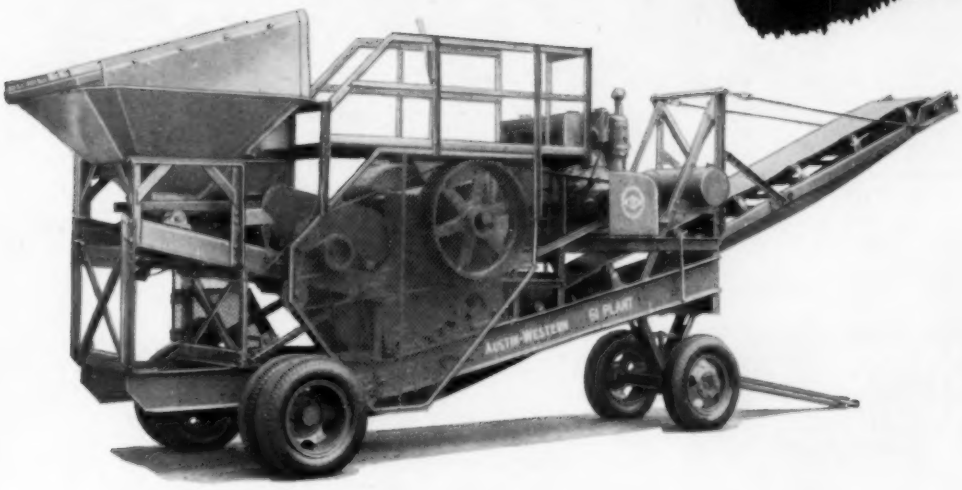
Mr. Forsman, like other Basic Refractories sales personnel, has a broad background of experience gained over a period of twenty years in the steel industry. Prior to joining the company he was associated with Youngstown Sheet & Tube Co. in East Chicago; Pittsburgh Crucible Steel Co. in Midland, Pa.; and Sharon Steel Co. in Lowellville, Ohio. During much of this period Mr. Forsman Worked as a melter on both open hearth and electric steelmaking furnaces.

C. W. Ingham has been appointed to cover the Ohio territory for the Multiwall Bag Division of the Albemarle Paper Manufacturing Co., Richmond, Va. Mr. Ingham's office is located at 81 State St., Columbus, Ohio.

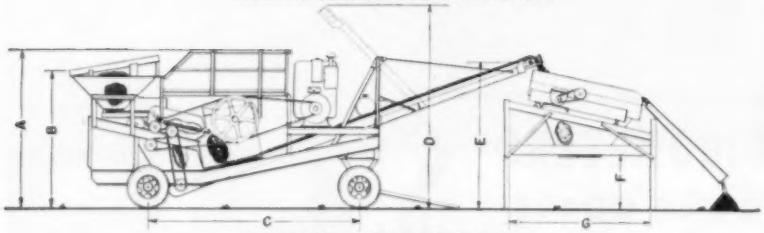
Traylor Engineering & Mfg. Co., Allentown, Pa., has announced the addition of B. F. Witmer to its engineering department. He came to Traylor from Vulcan Iron Works, Wilkes-Barre, Pa., where he was manager of cement equipment sales. Previously he was chief engineer for Allentown Portland Cement Co.

AUSTIN-WESTERN
PORTABLE CRUSHING PLANT

"61"



CLEARANCE AND FLOW DIAGRAM



CLEARANCES—MODEL "61" PLANT

A—Traveling Height.....11'-2"	E—Height at Center of Head Drum.....10'-5"
B—Loading Height..... 9'-8½"	F—Height Under Screen Mounting Frame to Ground..... 3'-8"
C—Wheelbase .....15'-0"	G—Length of Screen Mounting Frame.....Approx. 10'-0"
D—Height with Conv. Folded .....14'-5"	

COMPARE
then you'll specify
AUSTIN-WESTERN

DESIGNED FOR SMALL PROJECTS

Austin-Western "61" Portable Crushing Plant is especially engineered for the smaller projects such as county, township and municipal road building and maintenance. Because of its sturdy construction and stability, the "61" is adaptable to use wherever needed. When equipped with a 1024 Jaw Crusher the entire plant, less power, weighs approximately ten tons. The heavy welded channel frame requires no jacks. Dual rear tires give the plant great stability. The plant is equipped with a 24" x 26' channel frame delivery conveyor having a discharge height of 10'-5". With an Austin-Western "61" Plant you have greater portability, speedier set-up and higher production.

Welded steel plate crusher frame for high strength without weight of cast steel frame.

Machined steel toggle plate for absolute protection of crusher.

Inclined positive-throw type vibrating screen.

All bearings are anti-friction type.

Dual wheels are used on rear for added stability.

All drives are V-belts and fully enclosed gears.

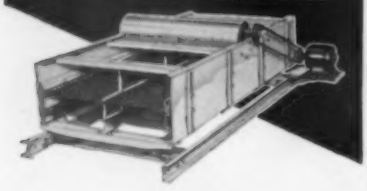
DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

Austin-Western
CRUSHING, SCREENING and WASHING EQUIPMENT

BALDWIN BLH LIMA HAMILTON
Construction Equipment Division

BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
LIMA, OHIO, U.S.A.

UNIVERSAL
OFFERS THE BEST
IN VIBRATING SCREENS
AT THE LOWEST PRICE



Before you buy, be sure to get a copy of the new UNIVERSAL Catalog #1501

There's a model to fit your particular requirement, priced within the smallest budget.

Write today for free catalog #1501

UNIVERSAL
VIBRATING
SCREEN CO.
Racine, Wisconsin
Quality Screens Since 1919

Thomas B. Rees has been assigned to the Charleston, W. Va., district as sales representative for Allis-Chalmers Mfg. Co., Milwaukee, Wis. He was formerly associated with Goodman Mfg. Co., Chicago, Ill.

Crusher Engineering Division of Poor & Co., Philadelphia, Pa., has appointed Forest Neely, John Kessler, Jr., and John Dellevigne, Jr., to new positions of responsibility.

Mr. Neely, formerly director of engineering, has been named director of development. He has since had experience in the solving of difficult crushing problems in the coal, cement, lime, by-product coke, central power stations and other basic industries. Prior to joining the staff of the new Poor & Co. Division, he was employed by Pennsylvania Crusher Co.

Mr. Kessler has been appointed chief engineer. Since 1938 he has been on the engineering department staff of Pennsylvania Crusher Co., and brings to his new position a knowledge of manufacturing methods and shop practices together with experience in the engineering and design of special purpose crushing machinery.

Mr. Dellevigne, appointed manager, parts service, was since 1936, associated as an engineer with General Steel Castings Co. His experience in this field will enable him to give special and specific attention to the sales and expediting of manganese and forged steel parts for users of all types of crushing machinery.

Kenneth O. Williamson has been appointed as assistant general manager for "Quick-Way" Truck Shovel Co., Denver, Colo. He has been associated with the Osgood (Marion-Osgood-General) Co. since 1941. While at Osgood he served successively, as assistant production manager, in direct sales; as branch manager and sales manager of Osgood-General; and after the consolidation of Osgood-General into Marion, as sales manager of Marion-Osgood-General from which position he joined "Quick-Way".

"Quick-Way" also announces the promotion of Daniel S. Heffron to the position of director of domestic and export sales. He has been sales manager for the past twelve years, being responsible for setting up "Quick-Way's" present distributor organization and is one of the most widely known men in the truck shovel industry.

K. O. Williamson

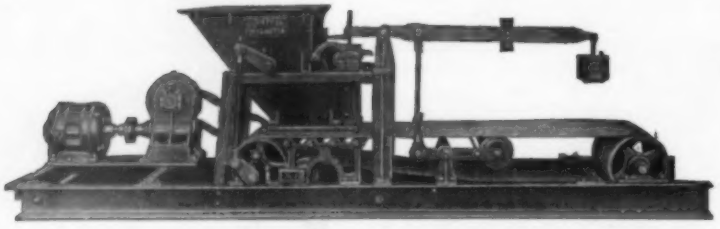
W. H. McAllister

William H. McAllister, has been named district manager by Marion Power Shovel Co., Marion, Ohio for a five-state area embracing Kansas, Oklahoma, Nebraska, Colorado and the western half of Missouri.

Mr. McAllister will be in charge of sales of all Marion machines in the five-state area and will work in cooperation with authorized Marion distributors throughout the district. His office is located at 1016 Baltimore Ave., Room 309, Kansas City 6, Mo.

He has been associated with the company since 1953, and prior to his appointment was in charge of the sales of Marion machines in the Dallas, Tex., area.

$ SCHAFFER POIDOMETERS $
PAY OFF IN LOWER COSTS
for Scaling Bulk Materials



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Industry

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CATALOG No. 5

Instant and precise weight-information is a "must" for bulk material producers.

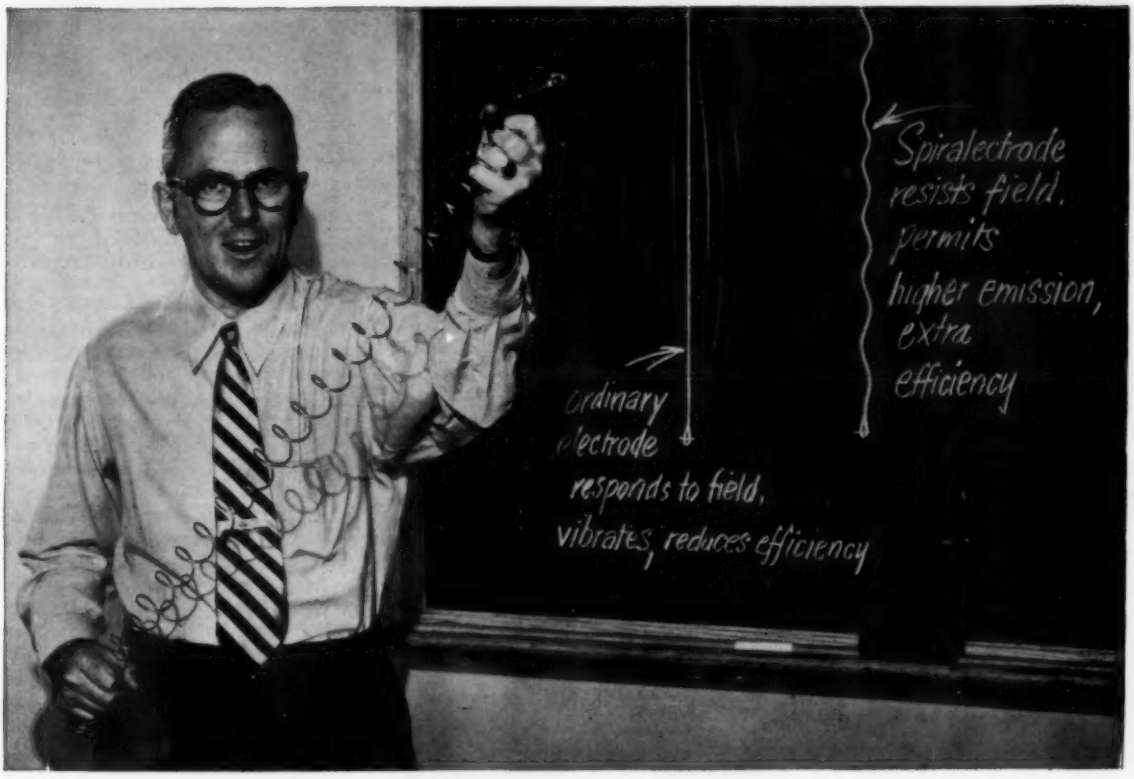
This data is supplied at minimum cost by SCHAFFER Poidometers . . . fast, accurate, automatic units that weigh, blend, feed, mix, record, and proportion.

Smooth working, easy to install and operate, Poidometers are soundly designed and ruggedly built for uninterrupted service.

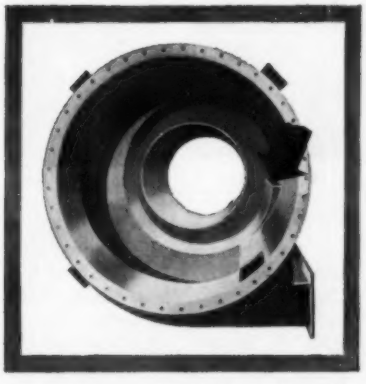
Available with remote control weighing and recording devices, and total weight recorders.

SCHAFFER POIDOMETER CO., 2828 Smallman Ave., Pittsburgh 22, Pa.

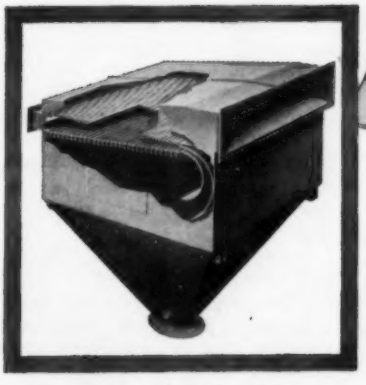
How Buell's Unique Spiralectrodes deliver EXTRA DUST COLLECTION EFFICIENCY!


Spiralectrode resists field, permits higher emission, extra efficiency
Ordinary electrode responds to field, vibrates, reduces efficiency

Coupled with the unique spiralectrode feature is Buell's Continuous Cycle Rapping—the most effective mechanism yet developed for dry dust precipitation. Completely eliminates puffing, keeps electrodes constantly clean. Re-entrained dust is minimized, peak efficiency is maintained.



Buell Cyclones also deliver extra efficiency, due to exclusive shave-off which harnesses double-eddy and puts it to work!



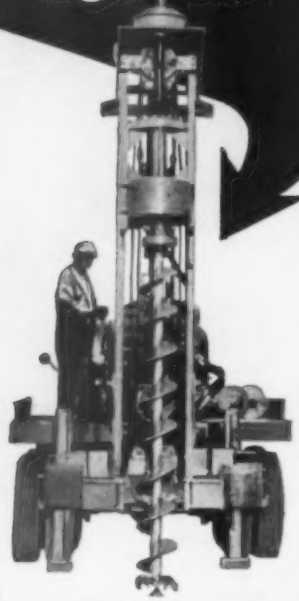
Buell's Low Resistance Fly Ash Collector combines top efficiency with low draft loss, for natural or forced draft installations.

For the complete story behind Buell's *extra efficiency*, write Dept. I-18, Buell Engineering Company, 70 Pine Street, New York 5, N. Y.

buell

MECHANICAL ELECTRICAL *Experts at delivering Extra Efficiency in* **DUST COLLECTION SYSTEMS**

World's heavy auger | fastest, vertical drill



NEW HEAVY-DUTY McCARTHY
drills 8-inch holes 100 feet deep in sandrock in 40 minutes *

This new heavy-duty drill, Model 106-24, is used for blast hole drilling, general exploration, foundation drilling, dewatering operations, deep post holes, etc., and is a companion drill to McCarthy 106-8 using 8" dia. augers and smaller. Has high-speed power take-off—one speed for rock, one speed for other earth formations. Outside power take-off for large augers at one-half speed. Hydraulically operated throttle valve.

AUGER DIAMETER		DEPTH OF BORE	
20 INCHES		30 FEET	
16	"	40-60	"
12	"	60-80	"
8	" and under	100	"

8" diameter auger bores through shale and sandrock. Larger diameter auger bores through shale and hardpan formations. The choice of contractors where the going is tough.

* Ohio River Colliery Co., Cheshire, Ohio

For complete information contact The Salem Tool Co.

THE SALEM TOOL CO.
1901 S. ELLSWORTH AVE.
SALEM, OHIO • U. S. A.

The Industrial Brownhoist Corp., Bay City, Mich., manufacturer of Diesel-Electric Cranes and similar heavy duty materials handling equipment has announced the election to its presidency of Max Riebenack III. Only 54 years old, Mr. Riebenack has, in his thirty years with the firm, become a well-known figure in the industry.

Joining Industrial Brownhoist in 1924, Mr. Riebenack was first assigned to Philadelphia as a sales engineer, and rose steadily, first to

Max Riebenack III

Stanley R. See

Philadelphia district sales manager, then to vice-president in charge of sales and advertising, and later to executive vice-president, the post he has just vacated to take over presidential duties.

At the same time Mr. Riebenack was named president, Stanley R. See was elected to the new position of vice-president and assistant to the president. He has been with Industrial Brownhoist since 1938, and was most recently director of sales for Industrial Brownhoist's eastern region.

Gilman Paper Co., 630 Fifth Ave., New York, N. Y., announces that F. L. Munger, formerly assistant to the vice-president in charge of sales, has been promoted to vice-president and sales manager of the Kraft Bag Corp., Gilman's bag manufacturing subsidiary. Prior to joining Gilman in 1953 as western sales manager in charge of the company's Chicago office, Mr. Munger had been with Bemis Bros. Bag Co., and earlier with St. Regis Paper Co.

Another step in realigning sales and executive personnel at Gilman are the following three promotions:

Larry K. Norton is now assistant vice-president and sales manager of Gilman's Standard Products Division. Homer Lake is now assistant vice-president and sales manager in charge of bleached and unbleached pulp and specialty papers. F. L. Munger is now vice-president and sales manager of Kraft Bag Corp., Gilman's bag manufacturing subsidiary.

Link-Belt Speeder Corp., Cedar Rapids, Iowa, has announced the appointment of the McAllister Equipment Co. as distributor for its complete line of crawler and rubber-tired shovel-cranes. The distributor is a newly formed organization which will specialize in sales and service of the Link-Belt Speeder shovel-crane line. It also offers related lines of contractors' equipment and supplies.

The new firm is headed by E. C. McAllister, former vice-president and sales manager of Patten Tractor & Equipment Co., Bellwood, Ill. He was with Patten since its organization in 1933.

The appointment of R. E. Burton to the position of assistant general sales manager of the Koehring Co., Milwaukee, Wis. has been announced.

In his new post, Mr. Burton succeeds M. O. Messenger who recently was named vice-president and sales manager for Koehring's Canadian subsidiary, Koehring-Waterous Ltd., in Brantford, Ont.

Mr. Burton has been associated with the Koehring organization since 1948. He started his career at the C. S. Johnson Co., a Koehring subsidiary located in Champaign, Ill., where he worked as a draftsman and as a sales engineer. In 1952 he became the Koehring Co. foreign representative to its subsidiary, Ishikawajima-Koehring Ltd., located in Tokyo, Japan.

R. E. Burton

Wallace L. Pepin

Wallace L. Pepin, parts manager, has been promoted to director of service for The White Motor Co., Cleveland, Ohio, with responsibility over parts and service. He succeeds Karl A. Roesch who was recently promoted to general manager of White's Autocar Division in Exton, Pa.

Mr. Pepin has been intimately associated with the parts and service business since joining White Motor in 1936. He became assistant parts manager in 1944 and parts manager in 1950.

The installation of a nuclear scanning device at Hudson Pulp & Paper Corp.'s Palatka, Fla. mill is announced by R. S. Hatch, vice-president for research and development. The scanner will continuously observe and regulate the quality of every foot of the company's kraft paper.

"The nuclear device," Mr. Hatch said, "will insure the production of paper with a uniformity of basis weight never before possible, even with the most skilled paper-making personnel."

The election of Warren E. Hill as president and director of Thermoid Co., Trenton, N. J., has been announced. He previously was executive vice-president and a director of Plax Corp., manufacturer of plastic products. He was also executive vice-president and director of Shellmar Products Co., which was acquired by Continental Can Co., Inc. He succeeds George S. Fabel, retired.

A $1,800,000 expansion program for the shops and offices of the Cedar Rapids, Iowa, Works, Allis-Chalmers Mfg. Co., is announced by B. S. Oberlink, vice-president and general manager, Construction Machinery Division, Tractor Group. The company's motor scrapers and motor wagons are made at Cedar Rapids Works.

The program will be started immediately and is scheduled for completion in early 1956. It will include the erection of new buildings and some replacement of old ones.

John F. Myers, internationally known author, consultant, and authority on flotation and grinding practices has joined Denver Equipment Co., Denver, Colo., as a consultant. Previously he was with Tennessee Copper Co., as superintendent of concentration.

Fred Zajac has been appointed Detroit service engineer for Acheson Colloids Co., Port Huron, Mich., replacing Frank M. Hunter, who is returning to the company's headquarters at Port Huron where he will supervise the laboratory phase of Acheson's sales engineering program.

Servicing all of northern and lower Michigan, with headquarters at 3000 E. Grand Blvd., Detroit 2, Mich., Mr. Zajac will provide technical assistance to industries using colloidal graphite and other Acheson products in their operations.

...Rugged, Efficient, Economical...
Pays for itself Quickly

For continuous and heavy duty service at constant capacity and efficiency, Norblo Automatic Bag Type Dust and Fume collection pays its own way—in the recovery of valuable materials or the removal of injurious or "nuisance" industrial air contaminants. Norblo builds the entire installation, from blowers to bag-cleaning mechanisms. Complete systems are engineered to meet specific situations, production layouts and required capacities. Norblo engineering insures low maintenance and no shut-downs—guarantees performance of every installation. Write for Bulletin 164-3.

Norblo also builds centrifugal and hydraulic dust collectors, exhaust fans, cement air cooling systems and portable dust collectors.

Cutaway shows Norblo basic unit of 78 bags. Automatic shaking and bag cleaning, one unit at a time, insures full use of cloth area better than 99% of the time.

The Northern Blower Company
Engineered Dust Collection Systems for All Industries
6407 Barberton Ave. Cleveland 2, Ohio

IT COSTS NO MORE

TO USE THE BEST

REPLACE WITH
"Indian Brand"

MANGANESE STEEL
Shovel Dippers
Dipper Teeth
Shovel Treads

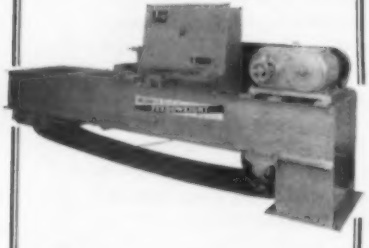
Crusher Jaw Plates
Mantles—Concaves
Bowl Liners
Roll Shells

Pulverizer Hammers
Grate Bars—Breaker Plates

Ball Mill Liners
Screen Plates

The Frog, Switch & Mfg. Co. CARLISLE, PA.
ESTABLISHED 1881

You're Sure with Merrick



FOR Positive Controlled Feed by Weight of Sand Gravel, Lime Clinker, Gypsum or other materials to Process—

Use the Feedoweight

Merrick Scale Mfg. Co.
Passaic, New Jersey

Neil E. Kile has been appointed plant manager of the Clinton, Mass. plant of The Colorado Fuel and Iron Corp., New York, N. Y. He was formerly sales and product manager of the Mechanical Specialties Department.

Mr. Kile will be succeeded by Ralph W. Ramer.

Appointment of Lively Equipment Co., Albuquerque, N. M., and their affiliate Lively Equipment Co., El Paso, Tex. as distributor for Nordberg POWER CHIEF Diesel engines in New Mexico, the El Paso area and northeastern Arizona is announced by the Nordberg Mfg. Co., Milwaukee, Wis.

Syntron New York Sales Co., handling the sales of Syntron Co., Homer City, Pa., has anounced the appointment of Preston Williams to their sales organization. He will handle customer relations, preliminary quotations and other general engineering and office problems.

Plans for expansion and modernization of its Bacchus, Utah dynamite plant have been anounced by Hercules Powder Co., Wilmington, Del., as part of a project which will terminate dynamite production at Hercules, in Contra Costa County, Calif., and devote that plant to the manufacture of nitrogen products and other chemicals.

The move will be made gradually and is designed to make the Utah plant one of the most modern explosives manufacturing units in the country.

Construction of the new facilities and modernization of the present Utah plant will be underway by early fall, with completion scheduled by next summer or the early fall of 1956.

E. H. Hughes, manager of the sales order department of The Timken Roller Bearing Co., Canton, Ohio, has been named to the newly-created post of assistant to the sales director. He started with Timken in 1938 and in 1950 was promoted to manager of the sales order department.

The appointment of J. L. Brown and Don M. Brown to the posts of assistant manager of the sales order department and manager of the allocations department respectively has also been announced.

Wallace E. Gordon, assistant director of sales of the Grasselli chemicals department of the Du Pont Co., Wilmington, Del., has been named to be director of the company's advertising department, succeeding the present director, William A. Hart, who is retiring.

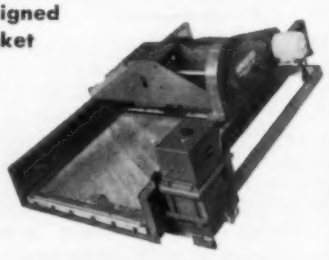
The W. W. Sly Mfg. Co., Cleveland, Ohio, has expanded its engineering and service facilities in the New England area with the opening of a new branch at 292 Worthington St., Springfield, Mass. Joseph Sharkey serves as district sales engineer in handling Sly's line of dust control systems, blast cleaning equipment, tumbling mills and industrial ovens.

Louis A. Ringman has been appointed fabrications manager at the Claymont, Del. plant of The Colorado Fuel and Iron Corp.'s Wickwire Spencer Steel Division.

Previously vice-president in charge of manufacturing for the Security Engineering Division of Dresser Operations, Inc., Mr. Ringman comes to CF&I with wide experience in the manufacture of heavy machinery and equipment.

New Screen Specifically Designed For Electrically Heated Jacket Operation

The strictly new Model E Leahy® Screen is clean cut in its design and construction for unmatched performance in handling damp and difficult materials such as lime, ag-lime and silica sand. With its simplified and efficient arrangements for jacket tensioning and adjustments you are assured more uniform tautness and most effective overall vibration of screen cloth. Mounting and demounting of jackets is easiest and quickest in field. There are absolutely no electrical connections to make or break. Capacity is increased and operating costs and troubles are reduced. Send for Bulletin 16-EH.

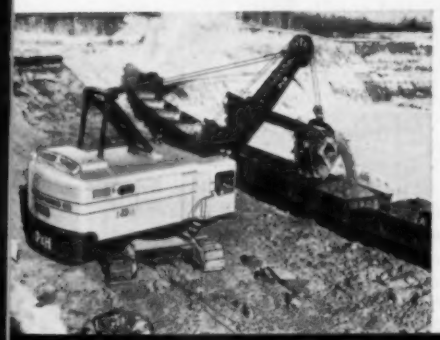


Made by the Original Deister Company Incorporated 1906

THE DEISTER CONCENTRATOR COMPANY
911 Glasgow Avenue, Fort Wayne, Indiana

P&H ELECTRIC SHOVELS

— cutting production costs in open pits everywhere!



Model 1600 — iron ore, Mesabi Range, Minn.

Model 1500 — taconite operations, Northern Michigan

Model 1055-E — sulphur vats, Louisiana

Model 1800 — copper mining, Arizona

Model 1600 — anthracite coal, Pennsylvania

Model 1600 — handling slag, Alabama

Model 1855 — stripping bituminous, Pennsylvania

Model 1400 — mining asbestos, Northern Quebec

Model 1400 — quarrying limestone, Iowa

From tail cable connection to dipper teeth — one responsibility — All P&H

Today, P&H leadership in *electric* shovel developments is more pronounced than ever. Such outstanding features as all-welded construction throughout and Magnetorque* hoist drive are combined with electrical equipment which is designed and built specifically for electric shovel service — not adapted for it. And now, P&H has stepped ahead with *Electronic Control* as standard on all P&H Electric Shovels. Get the facts. Harnischfeger Corporation, Electric Shovel Division, Milwaukee 46, Wisconsin.

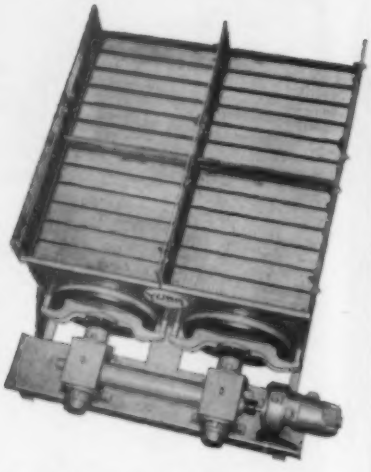
**T.M. of Harnischfeger Corporation for electro-magnetic type coupling.*

HARNISCHFEGER

the P&H *Line*

YUBA JIGS

for black sands



Handle any material that can be concentrated, such as

CASSITERITE	RUTILE
GOLD	SCHEELITE
PLATINUM, ETC.	GARNETS
MONAZITE	SAPPHIRES
ZIRCONIUM	IRON
ILMENITE	COPPER

YUBA jig action is positive. Just set to desired speed and stroke, get constant uniform pulsations that create surface action over full area of jig bed. Result: YUBA M-8 jigs have large material capacity per flow line under full control.

Stroke adjustments between ¼" minimum and 3" maximum are easily and quickly made. Maximum frequency of a 4 cell M-8 jig is 350 at ¼".

YUBA jig design saves space, increases production in new or old dredges or mills. Use to supplement existing jigs or replace other concentration methods. For details of adapting YUBA jigs to your operation, send us data on ore, feed sizes and present installation.

76

YUBA DREDGES — PROVED DEPENDABILITY

YUBA MANUFACTURING CO.

Room 651 • 351 California St. • San Francisco 4, Calif.

Robert S. Reaves has been appointed assistant to the vice-president, director of engineering, Tractor Group, Allis-Chalmers Mfg. Co., Milwaukee, Wis. He succeeds Harold W. Schudt, now president of Canadian Allis-Chalmers, Ltd., an Allis-Chalmers subsidiary.

Mr. Reaves became a member of the Springfield Works engineering department, after completing his training program, and in 1938 was transferred to the La Crosse Works engineering department.

Robert S. Reaves

B. C. Sears

The appointment of B. C. Sears, as regional manager—Great Lakes Region, with headquarters at Cleveland, Ohio, has been announced by Cummins Engine Co., Inc., Columbus, Ind.

Mr. Sears joined Cummins in 1946 as a junior test engineer; became sales engineer in 1948; and in 1950 was assigned to the Atlanta Regional Office as assistant regional manager. In 1953 he was transferred to Chicago as assistant regional manager for the Central Region. Earlier this spring, he was named regional manager—Rocky Mountain Region at Denver, a position he held until his latest assignment.

Dave Rankin Jr., the son of D. B. Rankin, is now associated with the Rankin Manufacturing Co., 616 Marengo Ave., Alhambra, Calif.

The young Mr. Rankin takes over duties in the National RANITE sales office upon completion of college at the University of Southern California, followed by two years post graduate work along with a teaching fellowship.

American Wheelabrator & Equipment Corp., Mishawaka, Ind., announces that it has changed its corporate name to Wheelabrator Corp. The move does not involve any alteration in ownership, management, or operation of the company, which manufactures blast cleaning equipment, dust and fume control equipment and foundry equipment.

Straub Mfg. Co., Inc., Oakland, Calif., designers and builders of the KUE-KEN jaw and gyratory crushers, have recently moved into a new plant serving the western states, western Canada, Alaska, Mexico and Central and South America. Pennsylvania Crusher Division, West Chester, Pa. is the exclusive licensed manufacturer and distributor of KUE-KEN crushers in eastern United States and Canada.

Brunner & Lay Rock Bit of Asheville, Inc., Asheville, N. C., have recently begun operations in a new, modern plant on Sweeten Creek Rd. The company's main office is at Franklin Park, Ill.

Thomas E. Ban has been named to the post of director of research for McDowell Company, Inc., Cleveland, Ohio. He will head a completely integrated industrial laboratory covering the field of minerals processing, including waste by-products recovery, ferrous and non-ferrous ore beneficiation, lightweight aggregate development, and cement making processes.

Following college and prior to joining McDowell, Mr. Ban conducted a four year research program covering agglomeration, magnetic roasting, and iron ore reduction for Cleveland Cliffs Iron Co.

Thomas E. Ban

Frank Blum

Frank Blum has been named general sales manager, P&H Industrial Division by Harnischfeger Corp., Milwaukee, Wis. He also becomes a member of the Harnischfeger executive committee.

The formation of the P&H Industrial Division is the result of greatly increased applications of P&H products in the industrial field. In addition to Mr. Blum's new overall responsibility he will continue in his present capacity as sales manager of the Overhead Crane Division.

Mr. Blum is a veteran Harnischfeger member, joining the corporation in 1929. He has been sales manager of the P&H Overhead Crane Division since 1942.

Fourteen new manufacturers' agents have been appointed by The Johnson-March Corp., Philadelphia, Pa., to distribute the company's dust control equipment in the rock crushing, mining and road construction fields. They will operate under the supervision of Johnson-March district managers and staff engineers.

The appointments are as follows: Acme Engineering Agency, Indianapolis, Ind.; J. H. Ballenger, Cincinnati, Ohio; The Dorner Co., Milwaukee, Wis.; Eastern Engineering Sales Co., Roxbury, Mass.; Charles A. Herron, Birmingham, Ala.; Victor H. Jones Co., Chicago, Ill.; Linder, Cox & Co., Lakeland, Fla.; Ralph E. Little, Davenport, Iowa; Osgood & Associates, Atlanta, Ga.; The Rhodes Equipment Co., St. Louis, Mo.; Southern Machinery & Supply Co., Roanoke, Va.; Stanley B. Troyer Equipment Co., Crosby, Miss.; United Equipment Co., Columbus, Ohio; and Western Ohio Ventilating Co., Toledo, Ohio.

Plans are underway for memorial rites at historic Wheeling Suspension Bridge in recognition of the contributions of engineering to the United States, and to the ingenuity of the master bridge builder, John A. Roebling, who redesigned and built the structure in its present form. The century-old span was constructed during the period when West Virginia still was a part of the state of Virginia.

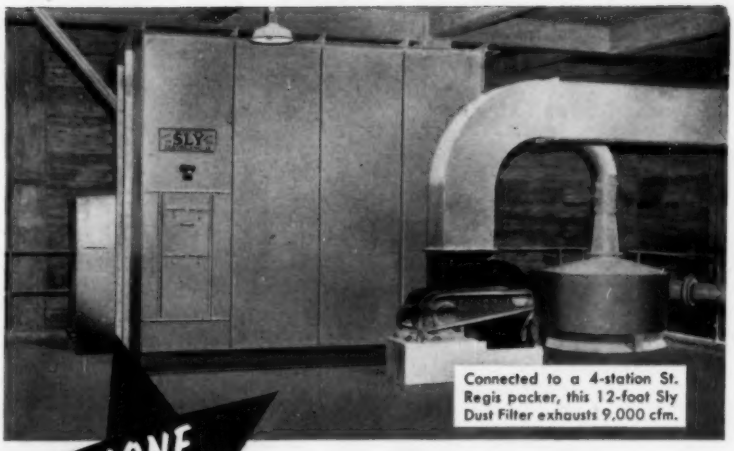
The memorial will be in the form of a large bronze tablet suitably inscribed and provided by John A. Roebling's Sons Corp., Trenton, N. J.

Repairs to the present bridge are planned in order to keep it in use. The memorial ceremony is planned for shortly after these repairs have been completed.

SKF Industries, Inc., Philadelphia, Pa., has announced the retirement of Frederick G. Roberts as assistant treasurer. He had been associated with the company in various capacities for 44 years.

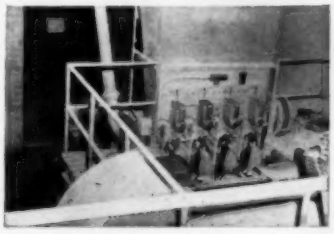
John A. McAdams, formerly general accounting manager, was elected an assistant treasurer of the company.

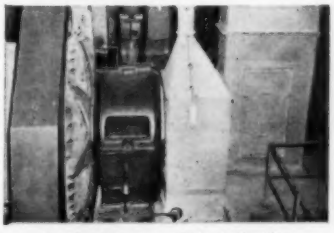
Also announced is the appointment of Richard M. Upson as personnel director, succeeding Mr. Harry S. Langdon, who has reached retirement age after 40 years with the company. Mr. Langdon will remain associated with the company until the end of the year as personnel consultant.

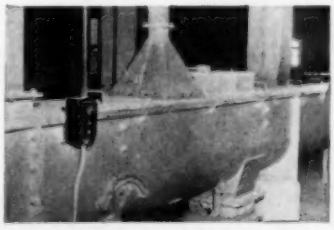


Connected to a 4-station St. Regis packer, this 12-foot Sly Dust Filter exhausts 9,000 cfm.

LONE STAR saves with SLY DUST CONTROL


Dust hood at 4-station St. Regis packer.


Dust hood at one of the ball mills.


Dust hood leading from 24" screw conveyor.

Cleanliness pays off in this Lone Star Cement Corporation plant where Sly Dust Filters give an *all star* performance, 24 hours a day, day after day.

These filters collect dust at critical points — save cement — effect operating economies — assure a cleaner plant. For Sly Dust Filters are designed and built with an abundance of cloth for greater filtering capacity and a 100% filtering job.

Top notch performance with *"no appreciable maintenance"*— such is the record of Sly in this plant as in thousands of others. Long experience, as pioneers in the field, provides a background for the advanced engineering Sly users receive.

If you have a dust problem, let's talk it over. Ask for Bulletin 98 — full of helpful information on controlling dust, *economically.*

Dust Control Systems, Blast Cleaning Equipment, Tumbling Mills, Industrial Ovens

THE W. W. SLY MANUFACTURING CO.

SINCE 1870

Visit Our Booth at the CHEMICAL SHOW Philadelphia, Dec. 5

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LORAINS MAKE MONEY AT THE QUARRY FACE...

BUT LOOK HOW *LORAINS* PRODUCE AT THE STOCKPILE, TOO!

Rock products men well know how Lorain shovels can dig the toughest rock. But have you noticed the many *types* of Lorains doing many other *kinds* of jobs in quarries today? For example, here are three ways Lorains can be used to handle stockpiled materials. Each problem was different, but the wide assortment of mountings and front ends in the Lorain line made it possible for each quarry to fit its needs for highest output and lowest cost. It will pay you to make Lorains the standard for your plant, because no other line can fit your many needs so well. Ask your Thew-Lorain Distributor for a job analysis and cost-cutting recommendations!

LOADING BINS

This plant selected a Lorain-50 Clamshell, mounted on a 14-ft. long crawler, for loading bins. The Lorain uses a 1-yd. clamshell bucket on a 50-ft. boom to handle an average of 1400 tons of sand daily, both in building stockpiles and charging 130-ton bins.

TRUCK LOADING

Here's a special Lorain loading tool for crushed stone, sand or gravel. It's a Lorain-25 Scoop Shovel, equipped with a big 1¼-yd. bucket for high capacity loading. Notice the horizontal thrust action of the bucket. It can crowd the bucket full, then revolve the turntable to dump the load without traveling the shovel.

SELECTED ORDERS

Is your problem one of "order picking" for selected deliveries . . . many frequent moves to different stockpile locations? This plant selected a mobile, 8 m.p.h. rubber-tire Lorain Self-Propelled Shovel, model SP-254W, to load from stockpiles as fast as trucks move in. Equipped with a 1-yd. shovel front end, here's a versatile tool that can dig at the quarry face, too.

THE THEW SHOVEL CO., Lorain, Ohio

THEW LORAIN®

HOW TO BUY CONVEYOR BELTS

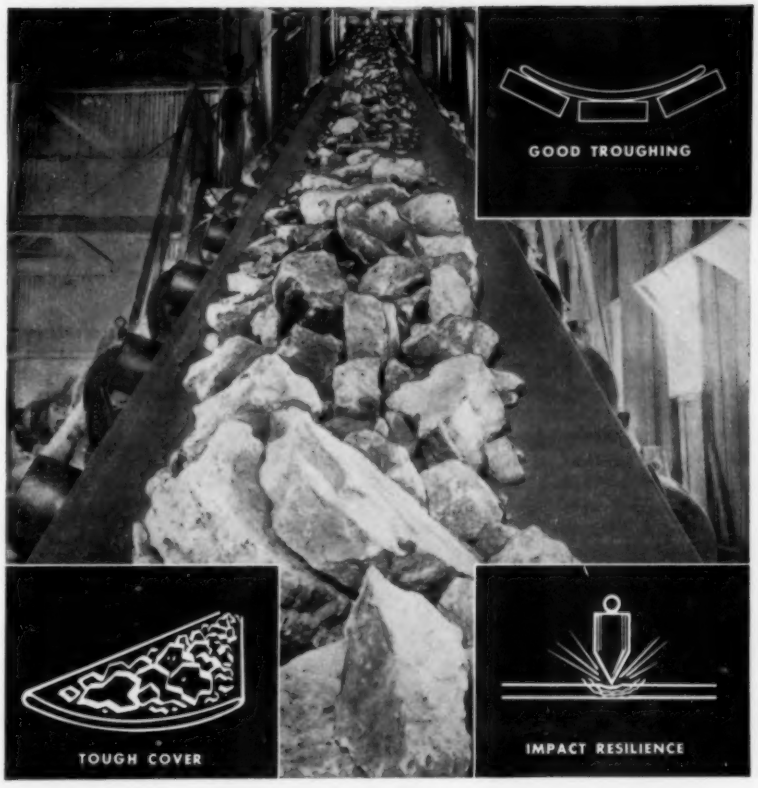
FOR LARGE LUMPS, ABRASIVE LOADS

and get "More Use per Dollar"

Select a belt that assures both maximum flexibility *and* loading impact resistance. One that has high draw-bar strength plus the ability to hold fasteners, and a cover that truly protects and prolongs belt life.

Heavy conventional duck belt constructions fail to provide the needed flexibility and resiliency to absorb heavy loads. They are stiff and "boardy", hard to train on the idlers. Look for a conveyor belt with strength members specially woven to trough easily and cushioned to withstand shock loading. Make certain the belt is moisture and mildew-proof, with protective outer plies and sufficient cover thickness to resist wear and prolong belt life.

Specify by name, the one conveyor belt that offers all these features . . . Ray-Man "F" Conveyor Belt.



RAY-MAN "F" CONVEYOR BELT

This Manhattan conveyor belt combines elastic cushioned inner plies in an outer envelope of strong, yet flexible, synthetic fabric . . . to withstand large, abrasive lumps . . . to permit easy troughability, even where only a thick, narrow belt is used. Special synthetic outer-plies provide maximum elasticity for rounding small pulleys in confined areas. Ray-Man "F" is mildew-proof and, like all Manhattan heavy duty conveyor belts, its service life is greatly prolonged by R/M's exclusive "XDC" Cover which protects it against abrasion, cuts and tears. For unusually abusive shock loading problems you may find extra-cushioned Homocord your best conveyor belt buy . . . or Ray-Man Tension-Master for extra long lifts.

Let an R/M representative help you select the best conveyor belt to meet your job requirement . . . you'll get "More Use per Dollar".

R/M

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls

UP AT THE COUNT OF TWO!

The World's Toughest Truck went down but it was not counted out. The accident occurred in Lorton, Virginia when this Reo, owned by the District of Columbia Department of Corrections, was being backed up to an excavation. Suddenly, ground gave way. The driver leaped clear, shouting a warning. An instant later, the Reo had flipped over in mid-air and was flat on its back at the bottom of the excavation. No one—including the Reo—was injured. Two hours later it was back in action! This is on-the-job proof of Reo's rugged dependability.

100,000 MILE WARRANTY on all Reo Gold Comet Engines! That's your assurance that—pound for pound—Reo offers you the greatest staying power, the greatest earning power for medium or heavy duty hauling. Both the Gold Comet Sixes (107 to 160 H.P.) and the Gold Comet V-8's (195 or 220 H.P.)—gas or LPG—are available in rugged Reo chassis engineered to your job. Get all the Reo facts before you buy your next truck.

REO MOTORS, INC.

SUBSIDIARY OF **BOHN** ALUMINUM AND BRASS CORPORATION

Reo Motors, Inc., Lansing 20, Mich. • Toronto, Ontario

REO

WORLD'S TOUGHEST TRUCK

TRUCKS, BUSES AND GOLD COMET ENGINES FOR ORIGINAL EQUIPMENT, INDUSTRIAL AND REPLACEMENT USES

"WE BOUGHT OUR *Second** ORTON CRANE BECAUSE . . .

"The ORTON crane delivers more actual hours 'on-the-job' work than any crane we've ever owned!"

(One reason is that an ORTON is so easily maintained. With all its modern developments, ORTON cranes have not sacrificed easy access to working parts.)

Don't overlook that an ORTON not only delivers more working hours, but, Air-operation and

Torque-Control

makes operating hours *less fatiguing* to man *and* machine! The *efficiency* of patented power-through-fluid Torque-Control *is unapproachable by even the most complicated mechanical or electrical systems.* Torque multiplication is *always* and *instantly* at the *exact* load requirement.

ORTON
CRANE AND SHOVEL CO.
608 S. DEARBORN ST., CHICAGO 5, ILLINOIS
Send for Catalog No. 84

* Send for a list of ORTON purchasers who have bought three or more cranes since the application of Torque-Control. We want you to base your decision on the testimony of ORTON owners.

RAYMOND SUPER ROLLER MILLS

For grinding:

LIMESTONE
GYPSUM
BAUXITE
BARYTES
PHOSPHATE
ROCK and
many other
NON-METALLIC
MINERALS

RAYMOND SUPER ROLLER MILL Equipped with double automatic feeders and whizzer separator with individual variable speed drive. May be equipped with Flash Drying Accessories for removing moisture.

RAYMOND builds a full line of Mills for pulverizing non-metallics, chemicals and manufactured products—in a range of sizes to meet your capacity requirements, from a few hundred pounds to thirty tons or more per hour.

for
producing
10 - 20 - 30
or more tons
per hour

Large capacities mean low costs when you use Raymond Super Roller Mills.

These big machines operate on a "mass production" basis, delivering maximum tonnage in minimum floor space.

This method centralizes operations, simplifies material handling, insures uniformity of product, conserves space, and saves manpower.

It also offers important economies in installation, maintenance and supervision costs, as compared to a multiple mill installation of equivalent output.

If you are replacing or augmenting your present grinding equipment, or building a new pulverizing plant, you should look into the advantages of Raymond Super Roller Mills.

Write for Catalog #72

COMBUSTION ENGINEERING, INC.

Raymond Division

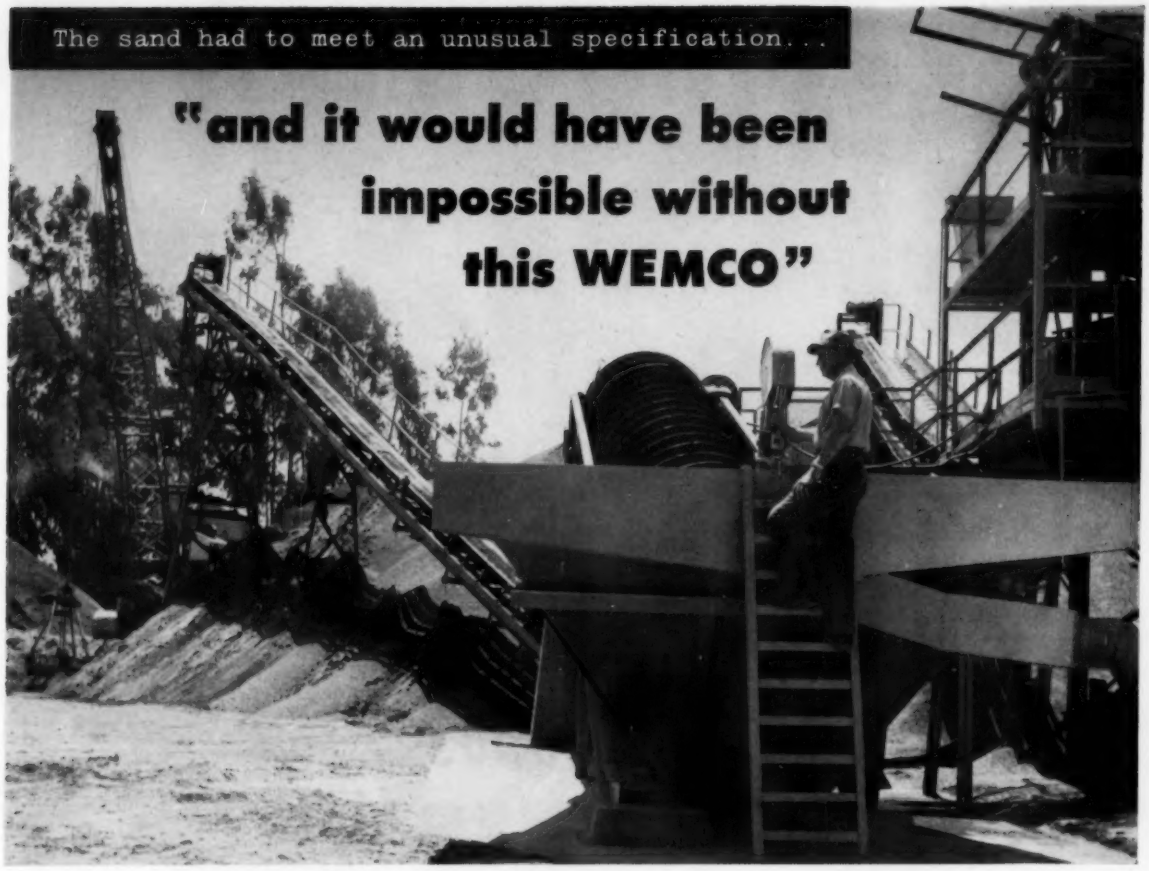
1321 NORTH BRANCH ST.
CHICAGO 22, ILLINOIS

SALES OFFICES IN
PRINCIPAL CITIES

Combustion Engineering-Superheater, Ltd. • Montreal, Canada

The sand had to meet an unusual specification...

"and it would have been impossible without this WEMCO"



When the Niles Sand and Gravel Company got the sand and aggregate order for the Ford Motor Company's new assembly plant in Milpitas, California, it was on the basis of an exceptionally rigid sand requirement. It has now been successfully fulfilled, and H. G. Clouser, Niles plant superintendent, reports, "this would not have been possible except for the adaptability of our 60-inch Wemco Sand Preparation Machine".

With 60,000 yards of concrete being poured on this one Ford plant, the fineness modulus was not permitted to vary more than 0.2%. Plus 200 mesh fines had to be retained in correct proportion and – 200 mesh had to be eliminated as completely as possible. A continuous materials testing program was under the direction of Hales Laboratories of Oakland.

After his experience on these very exacting requirements, Mr. Clouser of Niles Sand and Gravel Company states, "I believe that the Wemco Sand Preparation Machine, intelligently used, can meet practically any desired sand specification." "It has proven particularly adaptable to various operational changes we have made." "The hydraulic screw lift makes it readily adjustable to day-to-day pit variations." "And it has been one of the most troublefree pieces of equipment in our plant (three years running on its original wear shoes)."

For descriptive literature, write Dept. K-2442.

Plant operator Tom Brannon using the hydraulic spiral lift. This simple adjustment compensates day-to-day pit variations, and in locations where freezing is a problem may also be used to break surface ice (eliminating the need for draining the tank for overnight shutdown).

WEMCO®
WESTERN MACHINERY COMPANY

760 FOLSOM STREET • SAN FRANCISCO 7, CALIF.

Representatives in principal cities of the United States and Canada and in major countries throughout the world.

Athey HiLoader Loads
2700 TONS PER DAY . . .

2700 tons per day is a lot of material for one machine to load . . . but *two* Athey HiLoaders handle a combined 5400 tons per day for Northwest Materials Corporation, Bryan, Ohio.

Satisfied? Here's what they say: "The feeder action on the Athey HiLoader gives a continuous flow of material from stockpile to the conveyor for high production and maximum efficiency in loading trucks. We are loading moist sand from stockpiles for base material on the Ohio Turnpike.

"The ability of the machine to load to either side, as well as directly behind, with the swinging conveyor, makes for quick and easy spotting of trucks without any lost time to the Loader or trucks.

"Our daily production is 2700 tons per machine per 10-hour day. The machines are easy to operate and are ideal loaders for high production from stockpile to trucks."

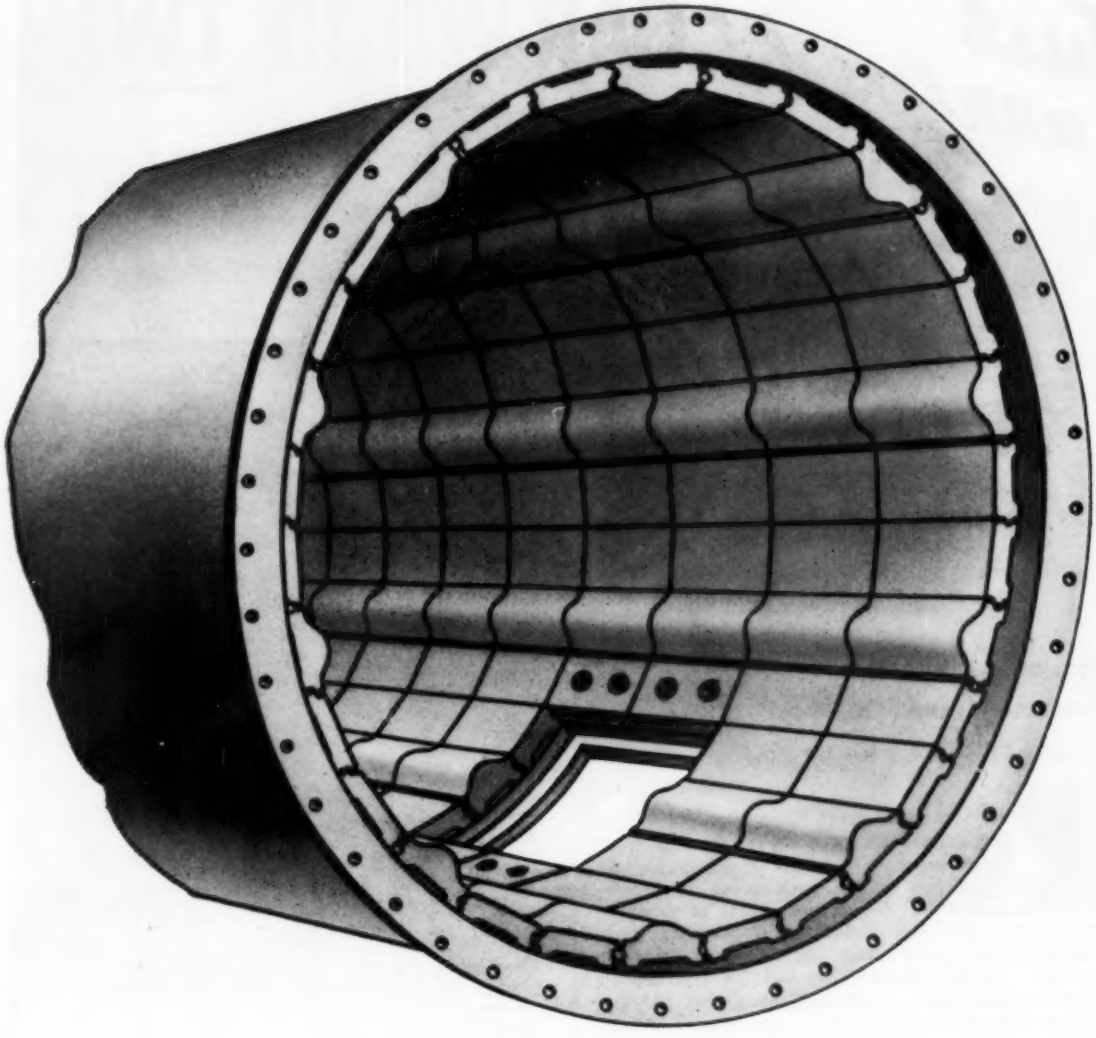
Another satisfied Athey owner talks straight from the shoulder, giving you reasons why it pays to own the Athey 125 HiLoader. Your Athey-Caterpillar Dealer will tell you more. See him soon!

Athey

PRODUCTS CORPORATION

5631 W. 65th St.

Chicago 38, Illinois



Babcock & Wilcox introduces a new type ball mill liner of Ni-Hard

Here's a view of the second compartment in a mill operated by a prominent midwestern Portland cement company, that uses 1¾ in. make-up balls.

It shows the new type Elverite C (Ni-Hard®) liners, developed and produced by Babcock & Wilcox, Barberton, Ohio.

The reported condition of these liners after 14 months' service indicates a 4-year life expectancy.

B&W is an authorized producer of Ni-Hard castings, and supplies these versatile liners in a combination of plain and wave segments to satisfy individual grinding requirements in mills of varying design.

It will pay you to learn what Ni-Hard can do for you. Instead of outmoded liner material, use Ni-Hard . . . because it brings you *abrasion resistance at lowest ultimate cost.*

INCO TRADE MARK **THE INTERNATIONAL NICKEL COMPANY, INC.** 67 Wall Street New York 5, N.Y.

Just arrived! GAR WOOD TWIN *Strong-Arm* HOISTS

...for large 4-wheelers, 6-wheelers and single-axle semi-trucks

Here's a rugged new twin 8" diameter Gar Wood Strong-Arm Hoist that's going to *revolutionize* your ideas of dumping efficiency with heavy-duty tandem-axle trucks and trailers. Available in *two sizes* — with 20" and 24" stroke respectively — the new model A-260 and 270 Strong-Arms have everything it takes to give you many extra hours of *smooth*, trouble-free service.

New massive torque tube automatically keeps both lift arms in positive alignment — regardless of load distribution — ends one-sided dumping strains. In addition, positive backstop, combined with dimpled oil by-pass, and cylinder-head-spring cushion, provide *triple protection* against over-travel damage. All excess weight has also been eliminated, to permit increased payload.

Famous precision-built Gar Wood pump assures the long trouble-free service you need on heavy-duty hoist installations. Write today for free literature.

New heavy-duty GC dump bodies are perfectly matched to give maximum payload production with the new Strong-Arm hoists.

NOW...A STRONG-ARM FOR EVERY NEED

Payload in tons at body lengths shown*

Body Lgth.	Standard Duty			Heavy Duty				
	A-30	A-40	A-50	A-60	A-70	A-90	A-260	A-270
8′	8							
9′		8	10	12½				
10′		7	9	11	12	17½	22	27½
11′		6	8	10	11	15½	20	24½
12′			7	9	10	14	18	22
13′					9	13	16	20
14′					8	12	15	18
15′							14	17
16′							13	16

*Based on Std. operating conditions, 12′ overhang and 55° dump angle.

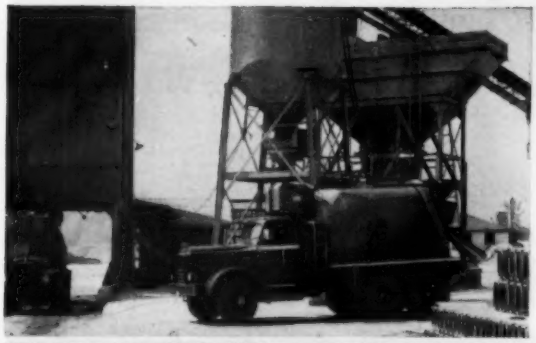
See these great new *Strong-Arm* Hoists and Dump Bodies at your Gar Wood Distributor — TODAY!

GAR WOOD INDUSTRIES, INC.

Wayne, Michigan • Richmond, California

GW-H-4r

WORLD'S LARGEST MANUFACTURER OF HOISTS AND DUMP BODIES FOR TRUCKS AND TRAILERS



EXTRA PROFITS from EVERY TRUCK,

with 2-WAY RADIO

Complete Control—Your dispatcher has constant contact with every operation every minute of the day . . . he knows where every truck is and the progress of every job . . . with Motorola 2-way radio, you can plan a more efficient work day, getting more production out of every mixer.

Rerouting—When a truck arrives at a form that's not ready, a quick Motorola call right from the truck, and the concrete is directed to a site nearby, saving valuable time and money.

Fast Repair—Prompt assistance is 2-way radio dispatched to a damaged truck in *seconds*, wherever it breaks down—virtual assurance against dumped loads.

Minimum Overtime—Motorola 2-way radio gets the job done faster and slashes costly overtime to a bare minimum.

Batch Plant Contact—Drivers can radio direct, telling how many more yards of mix will be needed. Guesswork is eliminated, and plant men get out on time.

Satisfied Customers—In this business, service is one of the biggest things you have to sell. With Motorola 2-way radio, you can keep your promises and deliver *when wanted*, even when emergencies crop up.

Radio's flexible operation makes this possible.

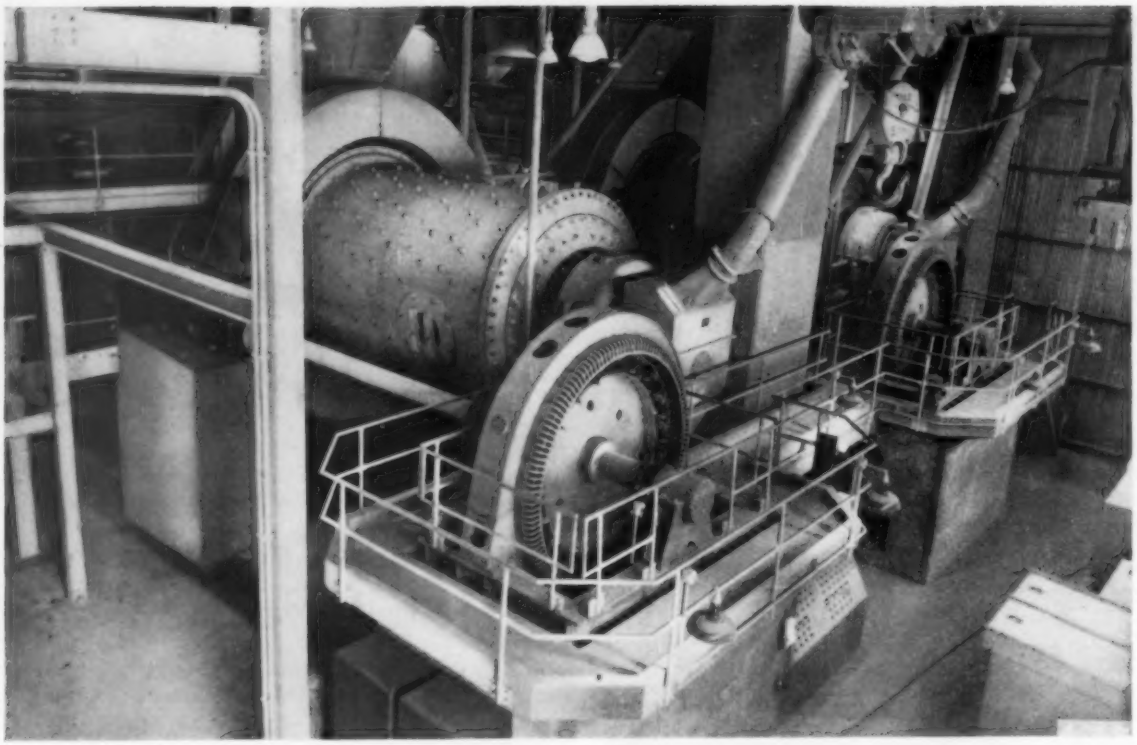
A Motorola engineer will show you how Motorola 2-way radio will earn extra profits from the *first day* of operation! Motorola will furnish the equipment you need on the terms you want—cash purchase, installment plan, lease (with or without equity) . . . with optional installation and maintenance all included in a single contract. Write, phone, or wire TODAY!

MOTOROLA

2-WAY RADIO

MOTOROLA COMMUNICATIONS & ELECTRONICS, INC.
A SUBSIDIARY OF MOTOROLA, INC.
4501 AUGUSTA BOULEVARD • CHICAGO 51, ILLINOIS
ROGERS MAJESTIC ELECTRONICS LTD. TORONTO, CANADA

Motorola consistently supplies more mobile and portable radio than all others combined.
Proof of acceptance, experience and quality.
The only COMPLETE radio communications service—specialized engineering . . . product . . . customer service . . . parts . . . installation . . . maintenance . . . finance . . . lease.
"The best costs you less—specify Motorola."



A Traylor Ball Mill Operator finds Grinding Costs Greatly Reduced

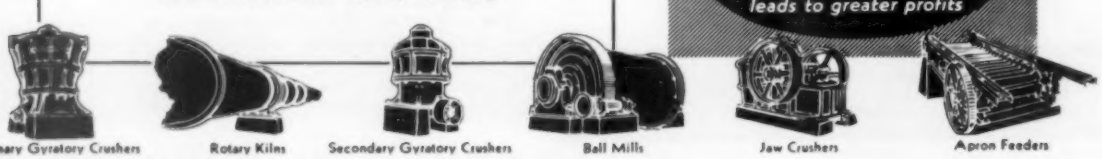
Not just one, but many, many producers have discovered new profits after turning their grinding operations over to Traylor Ball Mills. That's hardly surprising since everyone of these mills was "Traylored" to do a better grinding job . . . to assure a better product at less cost.

Traylor Ball Mills are fitted with a high pressure lubricating pump to coat the trunnions and "float" the mill as it's started. This overcomes high starting torques and undue wear caused by "dry" starting. The bearings are arranged for continuous self oil lubrication. Steel driving gears are precision cut with high and low addendum on a Maag gear generator. Shells are of heavy steel plate construction, automatically welded for thorough penetration and even flow of welding rod.

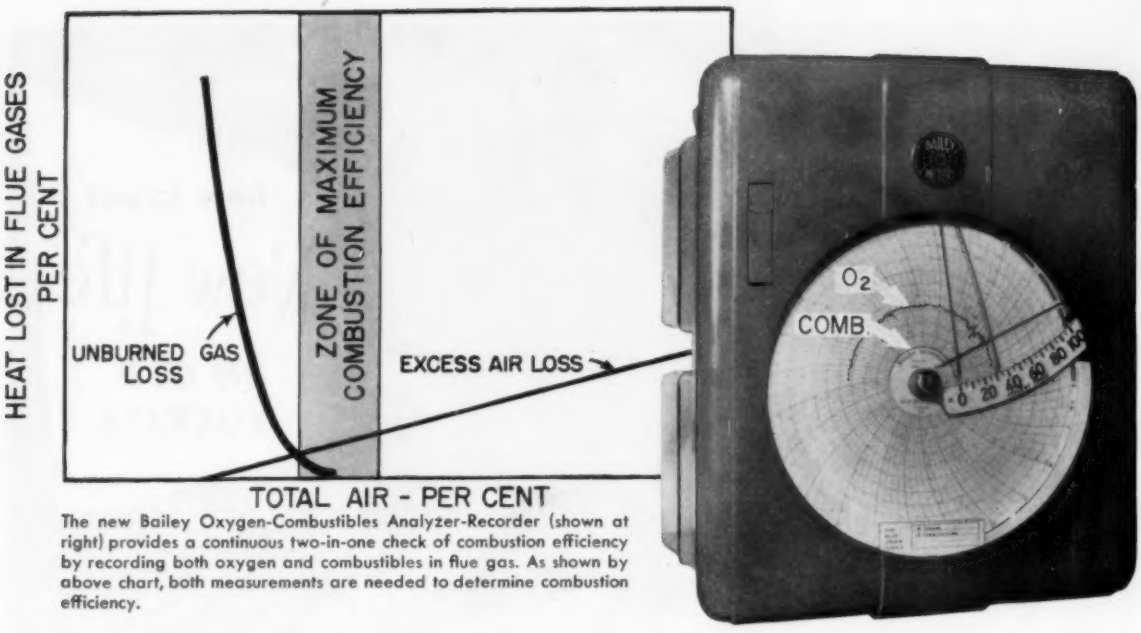
No matter whether you are grinding wet or dry materials, a mill can be "Traylored" to meet your individual needs . . . in practically any size. Have your mill "Traylor-Made" and you, too, will find grinding costs greatly reduced. For additional information request Traylor Bulletin No. 10-120.

TRAYLOR ENGINEERING & MFG., CO.
1716 MILL ST., ALLENTOWN, PA.
SALES OFFICES: New York • Chicago • San Francisco
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P.Q.

A Traylor leads to greater profits



Primary Gyratory Crushers | Rotary Kilns | Secondary Gyratory Crushers | Ball Mills | Jaw Crushers | Apron Feeders



The new Bailey Oxygen-Combustibles Analyzer-Recorder (shown at right) provides a continuous two-in-one check of combustion efficiency by recording both oxygen and combustibles in flue gas. As shown by above chart, both measurements are needed to determine combustion efficiency.

BAILEY announces . . .
New 2 in 1 way to measure Combustion Efficiency

The new Bailey Oxygen-Combustibles Analyzer-Recorder gives you a continuing double check on combustion economy. It's fast response measures and records:

1. Excess air—regardless of the fuel or combinations of fuels being burned.

2. The mixing efficiency of your fuel-burning equipment—by indicating the amount of combustibles in your flue gas, resulting from incomplete mixing of fuel and air.

Combustion efficiency depends upon fuel-air ratio. Too much fuel can be even more costly than too much air. And because of the interdependence of these two factors, no control that measures only one of them can give you complete protection.

Now, for the first time, you can check *both* with a *single* fast acting instrument, using the new Bailey Oxygen-Combustibles Analyzer-Recorder for industrial furnaces, kilns, heaters and boilers.

Fuel economy improves as excess air is reduced —until unburned fuel begins to show up in the flue gas. When this happens, combustion efficiency drops off sharply if there are further decreases in the air-fuel ratio. That's why combustion gases must be analyzed for *both* oxygen and combustibles to get a true indication of efficiency—and that is why Bailey coordinates both measurements on the same chart, to show when excess air may be reduced safely without danger of greater losses from unburned gases.

The Bailey Oxygen-Combustibles Analyzer is an approved combustion safeguard.

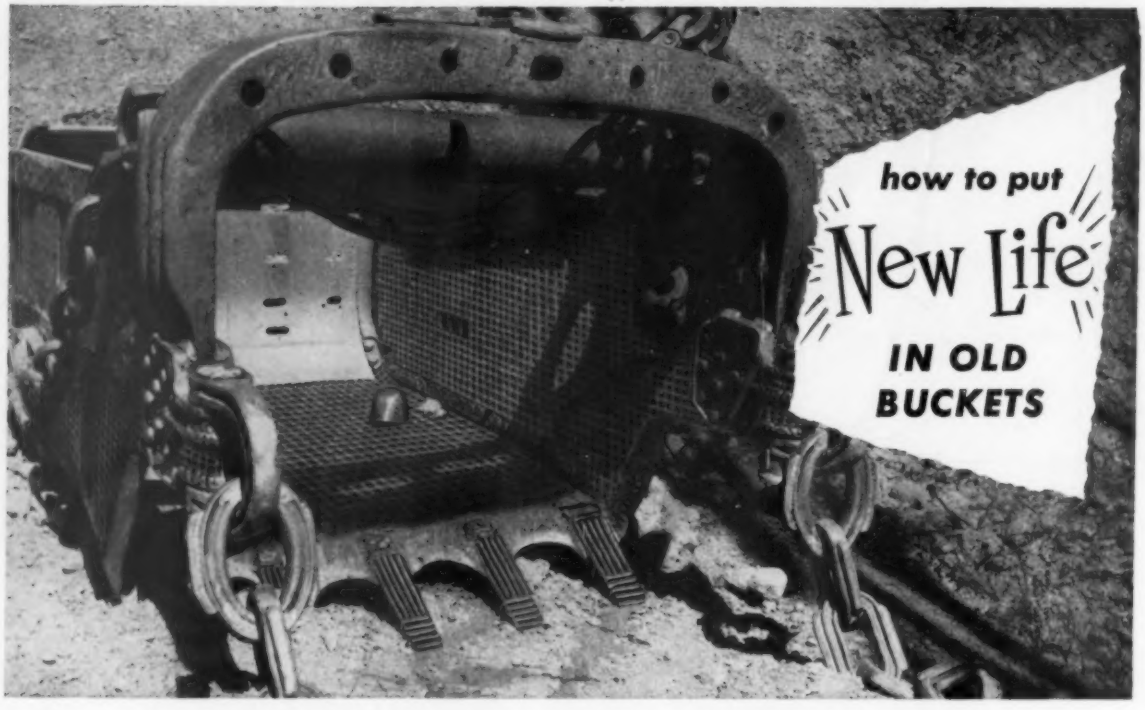
Ask your local Bailey engineer for suggestions on application. Equipment details in Product Specifications E65-1 and E12-5. P31-1

BAILEY METER COMPANY

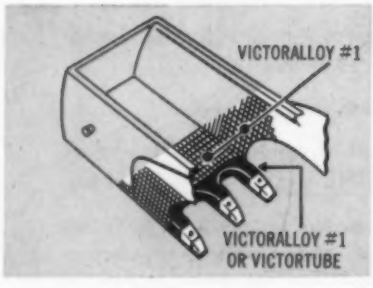
1051 IVANHOE ROAD • CLEVELAND 10, OHIO

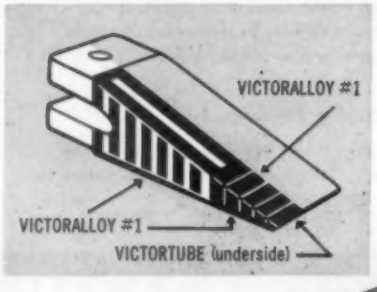
INSTRUMENTS AND CONTROLS

For Power And Process



USE VICTOR HARDFACING





Buckets . . . Apply VICTORALLOY #1 to top and bottom of bucket lips in overlapping beads. Protect other parts or areas showing wear with stringer beads of VICTORALLOY #1. Use 3/16″ coated VICTORALLOY #1 at 170 to 190 amperes, a.c. or d.c., or ¼″ at 200 to 225 amperes. If wear is unusually severe, substitute VICTORITE on bucket lips; use 3/16″ coated at 120 to 150 amperes, a.c. or reverse-polarity d.c.

Teeth . . . Apply VICTORTUBE to underside from point upward about 2″, and VICTORALLOY #1 to upper side of tooth same distance. Use stringer beads of VICTORALLOY #1 on balance of upper and lower surfaces, and on edges. Use 3/16″ coated VICTORTUBE at 130 to 160 amperes, a.c. or reverse-polarity d.c., and 3/16″ coated VICTORALLOY at 170 to 190 amperes, a.c. or d.c.

Why guess? . . . Select the right alloy from VICTOR's complete hardfacing line, made for both gas and manual or automatic arc application. New VICTOR illustrated hardfacing manual tells which alloys to use, how to apply. Ask your VICTOR dealer or write us today for your free copy.

Profitable dealerships open; inquire now!

VICTOR for hardfacing

VICTOR EQUIPMENT COMPANY
ALLOY ROD & METAL DIVISION
Mfrs. of welding & cutting equipment; hardfacing rods; blasting nozzles.

19-H

11440 So. Alameda St. • Los Angeles 59

WIRE ROPE AT WORK – The Marigold Coal Mining Company, Jasper, Alabama, specializes in stripping operations. The scene above is typical of the daily work; it shows a dragline excavator stripping off some 30 ft of overburden. When the pay seam is reached, the coal is broken out and loaded into trucks by a 1¾-yd shovel.

Because of the heavy loads handled with every drag, the powerful excavator requires the staunchest wire ropes. Three sizes of Bethlehem Purple Strand, ranging in diameter from 1¾ to 2¼ in., are used on the big machine. In a service more rugged than most, these tough, strong ropes have consistently proved their ability to take punishment, and to answer every demand with plenty to spare.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

MINING • QUARRYING • CONSTRUCTION • PETROLEUM • EXCAVATING • LOGGING • MANUFACTURING

STURTEVANT

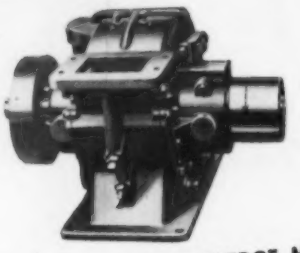
Laboratory Equipment...

assures accurate samples... cuts laboratory sampling costs

Sturtevant laboratory equipment have all the features of full-sized production machines with extra accuracy and wider range of adjustment built-in. They are fast... provide true samples of every batch processed.

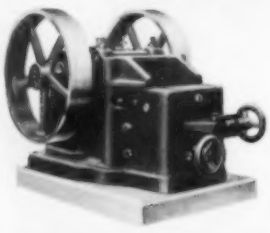
All Sturtevant machines have "open-door" accessibility which permits quick, thorough cleaning... prevents the possibility of previous batches from contaminating new samples. Their rugged construction assures round the clock operation with practically no maintenance.

Investigate Sturtevant equipment for your laboratories. They will help you cut sampling costs... improve product quality... increase sales. Write for catalog, today.



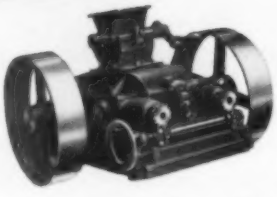
LABORATORY SWING-SLEDGE MILLS

Capable of reducing soft, moderately hard and tough or fibrous materials to any degree of fineness between 1 in. and 20 mesh. The patented "Open-Door" feature permits ready accessibility for cleaning.



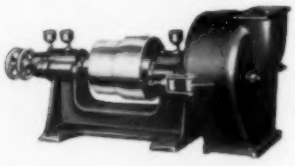
LABORATORY JAW CRUSHERS

Special Roll Jaw action simplifies close regulation of the product with capacities varying from 300 to 400 lbs. per hour at finest settings, to 1000 or 2000 lbs. when opened for coarser work. Each part of the crusher is accessible for quick and easy cleaning.



LABORATORY CRUSHING ROLLS

First designed especially for laboratory sampling work, Sturtevant Crushing Rolls are used regularly in many plants where there are limited out-puts. Range of output for the 8 x 5 size is from ½ in. to 20 mesh — and for the 12 x 12 size from ¾ in. to 20 mesh.



LABORATORY SAMPLE GRINDER

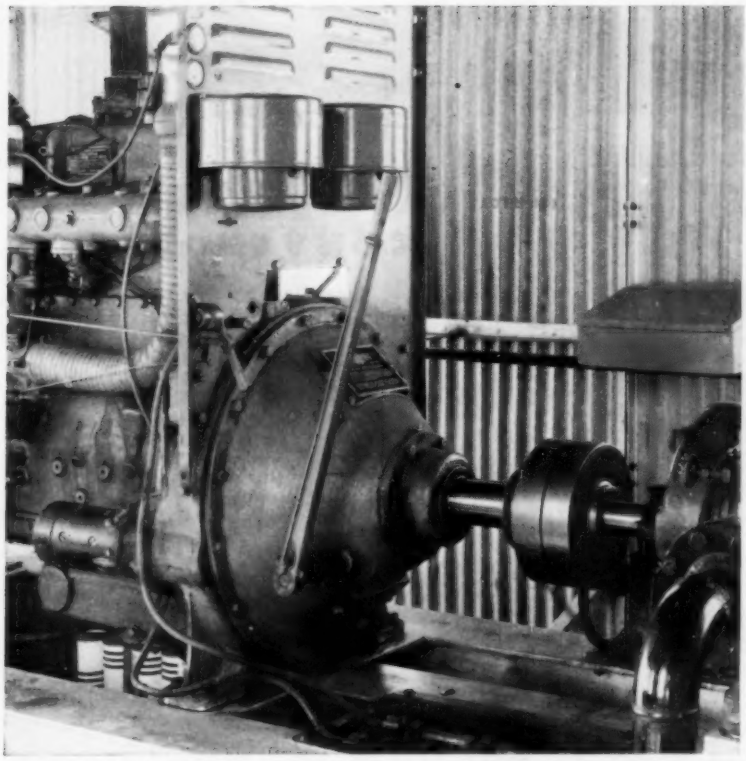
Laboratory Sample Grinders are of the "Open-Door" disc type and are capable of very fine work, producing products as fine as 100 mesh (coarser if desired) when working on dry, friable, soft or moderately hard materials. Simply turn hand wheel to provide product regulation from 10 to 100 mesh.

STURTEVANT MILL COMPANY

104 Clayton Street, Boston 22, Mass.

Designers and Manufacturers of

CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS • MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS



Twin Disc Friction Power Take-Offs are provided in single-plate 6.5" to 24"; double-plate 11.5" to 24"; triple-plate 14" and 18". Housing sizes No. 6 SAE to No. 00 SAE. Capacities to 650 hp. Typical installation shown is on a Waukesha gas engine. **Request Bulletin 129-C.**

Known by the power it applies

To both the engine manufacturer and user, the power take-off—connecting driving and driven equipment—is one of the most critical components in the driven line. Here is the vital link where all horsepower and torque must be transmitted before any work is accomplished . . . a link which can become a costly "Achilles" heel through failure on the job.

In specializing exclusively since 1918 in the design, manufacture and application of industrial drives for powered equipment, Twin Disc has developed Friction Power Take-Offs that assure trouble-free operation throughout the working life of machines to which they are applied. Designed for superior performance, they are backed for their lifetime with unparalleled service.

That's why the Twin Disc Power Take-Off is known by the power it applies. Throughout industry, you see them behind engines built by the world's leading manufacturers . . . for both manufacturers and users know *this* Power Take-Off will never become an "Achilles" heel on the job, to either operation costs or production schedules.

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC

Friction Clutches and Fluid Drives

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

Branches or Sales Engineering Offices: Cleveland • Dallas • Detroit • Los Angeles • Newark • New Orleans • Seattle • Tulsa

AJAX

ALLIS-CHALMERS

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CUMMINS

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INTERNATIONAL HARVESTER

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MM
Minneapolis-Moline
MODERN MACHINERY

MURPHY DIESEL

P&H

Superior

Waukesha MOTOR

WISCONSIN ENGINES

WITTE

All trade marks shown above are Reg. U. S. Pat. Off.

HOFFMAN Leads Again With New Bit Designs . . .

Oriented Diamond
TAPERED "Step-Core" BITS for faster penetration

Setting new records for speed and economy in drilling for dolemite, feldspar, etc., Hoffman Tapered "Step-Core" Bits penetrate faster —use less power—last longer because they greatly reduce the cutting surface. Developed to meet the demand of non-metallic drillers for a better Core Bit, these bits will drill and ream faster than ordinary bits core drill alone.

Just as with the other Hoffman Bits shown here, "Tapered" Step-Core Bits are set with oriented diamonds. They cut on a negative rake to produce clean, smooth cores that permit accurate identification of any formation.

DIAMOND CORE DRILLING SINCE 1902

Leading contractors in exploratory and grout-hole drilling and pressure grouting for more than half a century, Hoffman Bros. are equipped to save you money on your next drilling job.

HOFFMAN BROS. DRILLING CO.
Tioga Street
Punxsutawney, Pa.

Write for FREE Price List

S-A CONVEYORS
move from job to job to help
DAM RIVER in India

A complete S-A aggregate processing plant supplies the materials needed for a series of dams being built by the Damodar Valley Corp. in India. As each dam is completed, the entire plant is moved and re-assembled on the new damsite. Flexibility and dependability are built into every S-A engineered installation of pit and quarry equipment.

From secondary crusher in right foreground aggregate moves to battery of screens over storage bins at a rate of 200 tons per hour.

Five screens discharge sized aggregate to storage compartments from overhead belt conveyor system.

SINCE 1901 S-A STEPHENS-ADAMSON MFG. CO.

Write for information and details regarding S-A engineered equipment for your specific materials handling problems. No obligation, of course!

STEPHENS-ADAMSON MFG. CO.
20 Ridgeway Avenue, Aurora, Illinois
Los Angeles, Calif. • Belleville, Ont., Canada

Engineering Division	Specialists in the design and manufacture of all types of bulk materials carrying systems.
Standard Products Division	A complete line of conveyor accessories, centrifugal loaders, car pullers, bin level indicators.
Sealmaster Division	A complete line of industrial ball bearing units available in both standard and special housings.

For producers of Concrete Building Units, Pipe and Ready-Mixed Concrete.

SEPTEMBER 1955

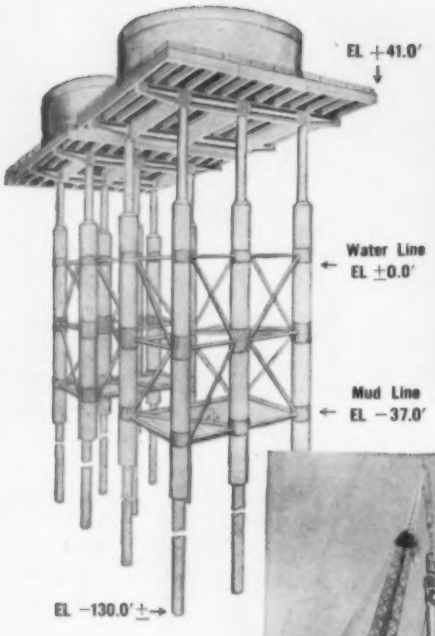
THE CONCRETE MANUFACTURER

A SPECIAL SECTION OF PIT AND QUARRY

Large Stockpile of Concrete Blocks in the Hugo Plant Yard of the Cleveland Builders Supply Company, Cleveland, Ohio. Perhaps the Nation's Largest Producer of Blocks in a Single Plant, This Company Uses High-Temperature-Carbonation Drying Prior to the Delivery of Any Units.

Pioneering IN PILING PROGRESS

192-FT.-LONG PRECAST, PRESTRESSED CYLINDER PILE AND PRESTRESSED JACKET ASSEMBLY HIGHLIGHT TANK PLATFORM CONSTRUCTION IN GULF OF MEXICO



Owner: **MAGNOLIA PETROLEUM COMPANY**
Tank Battery Platform, 35 mi. offshore in Gulf of Mexico

Entire Platform Structure Designed by **RAYMOND CONCRETE PILE COMPANY**, New York

Components fabricated by **GULF PRESTRESSED CONCRETE PRODUCTS**, Morgan City, La.

General Contractor: **J. RAY MC DERMOTT, INC.**, Harvey, La.

● Few construction principles have presented a broader opportunity for engineers and constructors than has prestressed concrete. Example of pioneering in this field is Raymond Concrete Pile Company's prestressed hollow cylinder pile, used in lengths up to 192 ft., in a tank battery platform for Magnolia Petroleum Company, 35 miles offshore in the Gulf of Mexico.

Photo, at left, shows 36-in.-diameter cylinder pile, 192 ft. long, standing unsupported 172 ft. above mud, in which it had penetrated 20 ft. under its own weight.

Equally interesting is the precast, prestressed concrete assembly which serves as bracing jacket. The jacket structure, shown above, consists of 54-in. prestressed hollow cylinder piles, braced with concrete-coated pipe. Assembled on barges, the jacket assemblies, each weighing 230 tons, were floated to location, where lift was made and the barge moved out from under.

The prestressed 36-in. cylinder piles were also barged to the site, lifted by crane, lowered through the jacket piles, and driven to required resistance. Finally, prestressed deck slabs were placed in position, ready for installation of two 5,000-barrel tanks.

These piles are reinforced in the conventional manner, then centrifugally cast by spinning. Cylinders are spun in 16-ft. lengths, fitted together, and prestressed by post-tensioning cables run through horizontal openings left in the cylinder walls.

Special methods of joining the cylinders, post-tensioning the steel, and grouting the wire cables produce a homogeneous product of unusual strength and durability.

As is so often true in milestones of construction progress, Lone Star Cement was used, because quality attracts quality.

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

LONE STAR CEMENT CORPORATION

Offices: ABILENE, TEX. • ALBANY, N. Y. • BETHLEHEM, PA. BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON INDIANAPOLIS • KANSAS CITY, MO. • NEW ORLEANS • NEW YORK NORFOLK • RICHMOND • WASHINGTON, D. C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 141,600,000 SACKS ANNUAL CAPACITY

TRANSIT
WESTINGHOUSE
MIXER

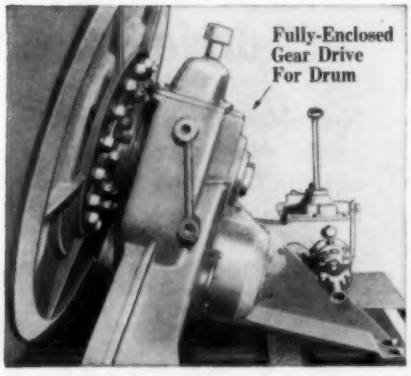
The Only Transit Mixer With Enclosed Gear Drive

● All other things being equal, or better, don't you think that a mixer with drum driven by enclosed gears would be preferable to one driven by exposed gears or chains? That's what you get in Westinghouse Transit Mixers—the only mixers with enclosed gear drive.

With this valuable patented feature you get a ball-and-socket self-aligning drum mounting, "double-action" mixing drum which accomplishes a quicker, more uniform mix, 2-speed transmission and other features which you'll like.

Westinghouse Mixers are thoroughly dependable and economical—time-tested by prominent users. They're available in 5 sizes—4½ to 6½ yd. Write now for descriptive literature to

ADAMS DIVISION
LeTourneau-Westinghouse Co., Indianapolis, Indiana
Member of NRMCA



The Westinghouse enclosed-gear drum drive requires no more attention than a standard automobile transmission. No chains to break—get too tight or too loose. No pinion and rack to wear out from abrasion. No daily lubrication . . . No stresses are transmitted to any part of drive due to frame flexing in traveling over uneven surfaces.

NOBLE-MOBILE

"Batching plant on wheels"

the complete plant that saves erection costs... drive it to the job site and start batching!

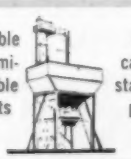
Noble-Mobile lets you batch at the job site proper where shorter hauls result in greater capacity. You go quickly into production . . . no footings, crane or electrical wiring required.

Noble-Mobile utilizes bulk cement. Aggregates charged with scooploader, conveyor or clamshell. 60 yards per hour or more output to truck mixers. Noble-Mobile drives the highways within legal limits. No special permit required.

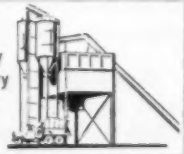
NOBLE BATCHING PLANTS

Noble-Mobile

Portable or semi-portable plants



High capacity stationary plants



• *DESIGNERS AND BUILDERS* •

For further details phone, write or wire **NOBLE COMPANY**

1860 7th Street, Oakland 20, California, TEmplebar 2-5785 • 20950 Center Ridge Road, Cleveland 16, Ohio, EDison 1-3426

The CONCRETE MANUFACTURER

September 1955

Fire is Your Business

THE week beginning October 9 has been proclaimed Fire Prevention Week of 1955 by President Eisenhower, who has called upon all Americans to support the endeavor. The President was referring not only to fires in homes and public buildings, where the loss of life is usually greatest, but also to fires in business and industrial structures. Such fires are also tragic as even the smallest causes loss of work and income to employees and loss of production and profits, perhaps even failure, to business. Every day there are more than 400 fires in business and industrial establishments and nearly half of these are destroyed.

Many of these businesses are partially or completely protected by fire insurance — even from business interruptions after a fire. Fire insurance cannot, however, protect against the many indirect losses that do not appear in the published fire loss data. Actual experience shows that the direct loss of property and content in a fire, multiplied at least by a factor of five, gives a reasonably accurate appraisal of the total losses involved. It is not surprising, therefore, that business mortality figures show that a business which has a major fire has only a 50-50 chance of resuming operations. Of the businesses which do withstand the first blow, one in four is forced to close shop within three years.

Fire is your business, and the best protection is prevention. We will not attempt, in this limited space, to summarize all of the fire prevention and protection techniques in detail but we quote some of the more obvious things that, according to the Southwest Research Institute, can be done to reduce the fire risk.

"1. Plant construction and expansion. Insist on building into your plant maximum fire protection. Don't crowd buildings or operations within buildings. Design your water supply with fire protection in mind. Use fire retardant materials and fire resistive construction.

"2. Housekeeping. Insist on a clean and orderly plant. Accumulations of combustible materials — grease, rags, papers, crates, etc. — are an open invitation to a fire accident. On the other hand, the incipient fire will soon go out or can be controlled easily if there is no fuel to feed it.

"3. Hazardous operations. Give particular attention to the use of solvents, to welding tasks, the storage and use of oils, fuels, and lubricants, paint spray booths, and a hundred and one other special hazards.

"4. Fire extinguishers. Equip the premises with conveniently located first aid fire extinguishers and be sure that your employees are trained in their use. Most fires can be controlled in this manner in their initial stages — If the workmen know how to use extinguishers and a satisfactory extinguisher maintenance program has been in effect.

"5. Fire Brigades. If yours is a large plant or is located beyond the city limits, establish a fire brigade and provide it with sufficient training and equipment so that larger fires can be controlled. Many workers are willing to serve in this way just to protect their own jobs.

"6. Sprinklers. The record of fire losses in sprinklered buildings is remarkably good. Install automatic sprinkler systems and provide for periodic maintenance.

"7. Seek competent advice. The fire chief or fire marshal in your city, or from the nearest city, is well trained in his field. He will be glad to advise with you — call him in occasionally.

"Many fire insurance companies and insurance rating bureaus provide a free advisory service that will help you guard against loss from fire. Or you can engage the services of fire protection engineering consultants."

Walter E. Trauffer

BESSER

The Washington, D. C. Skyline as it is viewed from the Washington Concrete Products, Inc. cement tower.

★This is the 122nd of a series of ads featuring leaders in the Concrete Block Industry who are stepping up block production with Besser Vibrapac machines.

2 generations in both executive and plant management. (Left to right) President Austin Davis and his father, Herbert Davis, long an outstanding figure in the concrete block industry. Ernie Hileman, shop foreman and his father, E. A. Hileman, Sr., plant superintendent.

One of the Vibrapacs in operation. Produces high quality block on a fast production basis. Machine is fully automatic. Only one man required to guide the power off-bearing hoist.

Special "dunking" device, showing how the company dips racks and pallets in oil.

Washington Plant Prefers High Production VIBRAPACS to Meet Rising Competition

Washington Concrete Products, Inc., Arlington, Virginia, began block making operations in 1924. Nineteen years later they installed their first Besser Automatic Tamper. In 1947 additional production was required and they installed their first Vibrapac. One year later another Vibrapac was added. Both machines have now been replaced with the latest model front feed Vibrapac.

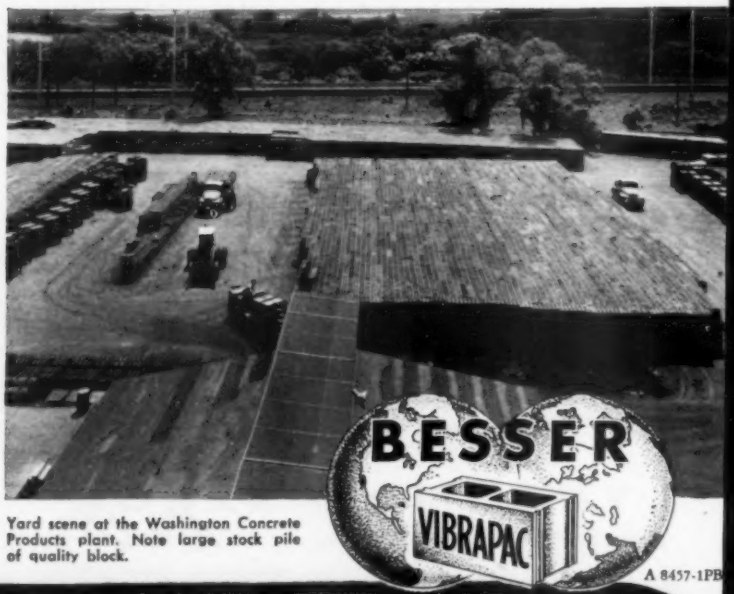
Why are Vibrapacs used, exclusively? Company officials like their high production of quality block with minimum of downtime. That means greater output . . . more satisfied customers . . . bigger profits. President Davis puts it this way: *"We have confidence in Besser's ability to keep us efficient in a highly competitive market".*

You, too, can UP profits with dependable, High Production Vibrapac machines. Contact your nearby Besser representative, or write:

BESSER COMPANY

BOX 131 • ALPENA, MICHIGAN, U. S. A.

Complete Equipment for Concrete Block Plants



Yard scene at the Washington Concrete Products plant. Note large stock pile of quality block.

A 8457-1PB

News of the Concrete Industries

Third Annual Sales Meeting Of Perlite Division Men Held in Boston on June 6-8

The third annual Permalite National Sales Meeting, held each year by the Perlite Division of the Great Lakes Carbon Corporation and its international marketing organization of Permalite franchisees, was held at the Sheraton Plaza Hotel, Boston, Mass., on June 6, 7, and 8. Forty-one men, representing 20 of the 23 franchises, were present.

J. John Brouk, president of J. J. Brouk and Company, St. Louis, Permalite sales agency, was chairman. Walter A. Watson, advertising manager of the Perlite Division, was co-ordinator. The Whittemore Company, Permalite franchise in Boston, was the host.

Great Lakes Carbon officials and executives participating in the sales meeting included: De Otis L. Marlett, vice-president and general manager of the Perlite and Dicalite Divisions, Los Angeles; Henry R. Richmond, assistant to the vice-president and general manager, Los Angeles; Dr. Paul W. Leppla, technical director, Los Angeles; Frederic M. Brose, western operations manager, Perlite Div., Los Angeles; Walter A. Watson, advertising manager, Perlite Div., Los Angeles.

William R. Howell, chairman of the Permalite New Uses Committee, presented plans for numerous new products and new uses, including new applications for Permalite plaster and concrete, loose fill, acoustical plaster, insulating plastic, patching plaster, soak-up, soil conditioning, stucco, tile-set, concrete blocks, refractories, castables, and a new lightweight asphalt concrete to be marketed under the trade-mark "All-Weather Crete".

Walter A. Watson, chairman of the Permalite advertising committee, presented plans and policies for the new complete program of Permalite advertising, sales promotion, public relations and trade relations, at both national and local levels.

Concrete Pipe and Products Company, Richmond, Va., acquired the Southern Brick and Supply Company of the same city, effective June 30. There are no projected personnel changes in the company.

Charles N. Beatty, Pennsylvania Perlite Corp., Allentown, Pa., (center), first Permalite franchisee, welcomes Jesse L. Maury, Atlantic Perlite Co., Washington, D.C. (left) and O. N. Gregg, Gregg Products Co., Grand Rapids, Mich., new franchisees.

Production of three types of dry concrete premixes—sand, masonry, and gravel—has been started by the Des Moines Concrete Products Company, West Des Moines, Iowa.

Coming Events

October 10-12, 1955—St. Petersburg. First National Prestressed Concrete Short Course. Maritime Base.

October 17-21, 1955—Chicago. 43rd National Safety Congress and exposition. Conrad Hilton, Congress, Morrison, and La Salle Hotels.

October 31-November 1, 1955—Atlanta. Regional meeting, American Concrete Institute. Atlanta Biltmore Hotel.

November 14-16, 1955—St. Louis. Fifth Annual Short Course School of Instruction. American Concrete Pipe Association. Chase Hotel.

November 21-23, 1955—Houston. 12th annual meeting. Southeastern Concrete Masonry Association (in conjunction with Texas Concrete Masonry Assn.). Shamrock Hotel.

January 23-25, 1956—New Orleans. 36th annual convention, National Concrete Masonry Association. Roosevelt Hotel.

February 13-16, 1956 — Chicago. 26th annual convention and biennial exhibit, National Ready Mixed Concrete Association. Headquarters, Conrad Hilton Hotel; exhibit, Coliseum.

New York Firm Formed To Sell Fly Ash Admixture From Local Power Station

Atlas Fly Ash Corporation, Inc., is the name of a new firm recently formed to market fly ash commercially. A group of Buffalo businessmen have organized the company, the source of the material being the Huntley steam generating station of the Niagara Mohawk Power Corporation, Buffalo, N. Y., where some 90,000 tons annually are available.

Officers of the new company include Frederick W. Reinhold, president of Anchor Concrete Products Co., Buffalo, president; George E. Weichmann, president of B.A.W. Construction Co., vice-president; William L. Schiesel, treasurer of the Anchor Co., treasurer; Mursett C. Luchner, attorney, secretary. Francis X. Doherty, of Niagara Mohawk, is to be in charge of the production of the fly ash at that company's station source.

Calcium Chloride Institute Names Dickinson Chief Engr.

W. E. Dickinson

Appointment of William E. Dickinson, highway and concrete engineer, to the position of chief engineer has been announced by G. H. Kimber, president. The Calcium Chloride Institute is a non-profit engineering service organization.

During his service with the Institute since 1946, Mr. Dickinson has presented technical papers at state and national meetings of various engineering organizations including the American Road Builders' Association, the American Concrete Pipe Association, New England Testing Engineers, and the National Association of Independent Tire Dealers.

Robert Maddox, president of Perma Stone, Des Moines, Iowa, and Acousti-Celotex, has announced the firm has moved from 1404 Keosauqua to larger quarters at 412 E. Grand Ave. The Davenport branch has been transferred to 422 Western Ave. in that city.

The drive that set a ***NEW STANDARD of***

PERFORMANCE

for Fork Lift Trucks

No other fork lift truck can match the smooth-power performance of a Towmotor with *TowmoTorque* Drive. There's no clutch to throw, no gears to shift. The exclusive *TowmoTorque Creep Control* allows full power for lifting while positioning the truck. "Forward" or "reverse" can be preselected *while truck is in motion* for fast get-away! And *TowmoTorque* lasts the lifetime of the truck with less maintenance than any other drive.

TowmoTorque is the only drive engineered for all fork lift truck operations. It is available in Towmotor Fork Lift Trucks exclusively. Get the facts from your nearby Towmotor Representative, or write TOWMOTOR CORPORATION, Div. 1309, 1226 E. 152nd St., Cleveland 10, Ohio.

TOWMOTOR
THE ONE-MAN-GANG
®

FORK LIFT TRUCKS and TRACTORS
SINCE 1919

Manufactured Only By Towmotor Corporation — The Pioneer Maker Of Fork Lift Trucks

Prestressed Short Course Scheduled for Oct. 10-12 At St. Petersburg, Fla.

The first national Prestressed Concrete Short Course will be held at St. Petersburg, Fla., on October 10-12, 1955. Co-sponsored by the Prestressed Concrete Institute and the Department of Civil Engineering of the University of Florida, it offers an excellent opportunity for the practicing and student engineer to become familiar with the theory and design of prestressed concrete structures.

The first two days of the short course will be devoted to lectures on beam theory, basic theory of prestressing, methods, materials, post-tensioning and pre-tensioning, and design of beams. Each class will be limited to 50 registrants in order to permit personal supervision. The third day will be devoted to papers, movies, and slides presented by outstanding engineers in the field of prestressing. Topics involving materials, design, manufacture, present use and future possibilities of prestressed concrete structures will be discussed. An optional field trip to one of the casting yards in the area is planned.

Due to the large number of engineers expected to attend this course, accommodations have been made available at the Maritime Base, St. Petersburg, Fla., where facilities are ample. The registration fee will be $25.00 for the three-day period. It will be necessary to register in advance. Details of the program and final registration cards will be sent to all persons indicating their interest by addressing A. M. Ozell, Course Supervisor, Civil Engineering Department of the University of Florida, Gainesville, Fla.

N. J. Concrete Products Group Elects W. J. Decker Exec. Sec.

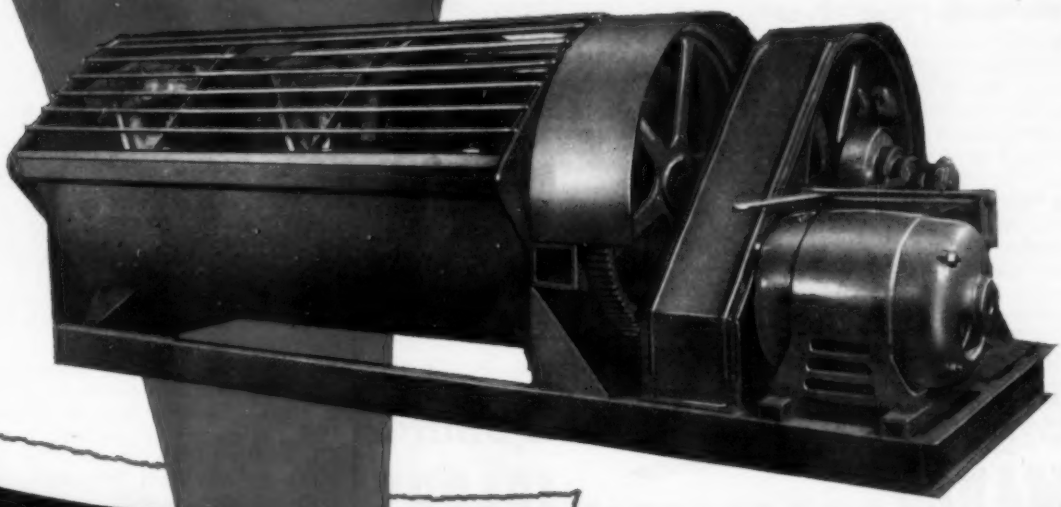
The New Jersey State Concrete Products Association has been reorganized with Walter J. Decker as its executive secretary.

Mr. Decker can be reached in care of the association offices located at 343 Broad Avenue, Ridgefield, New Jersey. Albert J. Faber of the Faber Cement Block Company, Paramus, is the president of the group.

• Correction

We regret that the dates for the National Concrete Masonry Association's 36th annual convention were incorrectly given in the August Coming Events box. The correct dates are January 23, 24, and 25, 1956. Convention headquarters will be at the Roosevelt Hotel in New Orleans.

ALL MIXERS LOOK ALIKE



. . . . but check the PERFORMANCE!

PLUS GOCORP SKIP LOADERS TO DELIVER THE GOODS

Whether for transferring mixed concrete from the mixer to the main supply hopper on your block machine or for conveying dry material to an elevated mixer or bin, there is a GOCORP skip loader to match every GOCORP Mixer. Vertical or inclined track • 12 to 75 cubic feet capacity • Specials to solve *your* problem.

INCLINED SKIP INSTALLATION. Mixer is mounted below floor level for handy charging. Convenient for bagged cement too. Angle and length of tracks may be varied to fit your needs.

HERE'S WHY GOCORP OUT-PERFORMS THEM ALL

- **NI-HARD SECTIONAL LINERS**—Longer wearing, quicker to install.
- **NI-HARD RIBBON BLADES**—for a thorough faster mix—Last longer.
- **BEARINGS**—Extra oversize, self-aligning, anti-friction—standard on all GOCORP mixers.
- **NI-HARD DUST HUBS AND RINGS**—Better seal, longer wear.
- **WATER DISTRIBUTING MANIFOLD**—Quick, effective, uniform water distribution.
- **CUT STEEL GEARS**—Assures proper mesh—trouble free.
- **CLUTCH PULLEY**—Heavy duty, friction type, controlled from charging side.
- **DRUM CONTOUR**—Safer, reduces spillage when overloaded.
- **POWER**—Oversized motors on all models.
- **DRUM GRID GUARD**—Permits safe charging and complete visibility. Optional on smaller sizes.
- **AIR OPERATED DISCHARGE DOOR AND MIX-TIMER**—Standard equipment on 75 cu. ft. mixer, optional on smaller sizes.
- **GOCORP'S ENGINEERS** are also prepared to meet your special needs including left-hand drive and truck mounting.

GOCORP MIXERS come in all sizes from 12 to 75 cubic feet. There is one to meet your requirements regardless of the size of your block machine or the aggregate used.

GOCORP
ADRIAN-MICH.

454 Grace Street Adrian, Michigan

Livingston Rock & Gravel Opens Ready-Mix Plant With "Coffee And" Event

Several hundred guests responded to the invitation of the Livingston Rock & Gravel Co. to visit and inspect the company's new Metropolitan ready-mixed-concrete facilities in Los Angeles on the morning of August 3, 1955.

A "hunt breakfast," served under canvas on the plant premises by one of Hollywood's film studio catering firms, was the first order of the morning for the visitors, who began arriving as early as 7:30 a. m.

The Metropolitan plant is located at 506 Bauchet St., close to downtown Los Angeles, and is one of the most modern in southern California. It has a batching capacity in excess of 150 cu. yd. of concrete hourly, is fully automatic in operation, and entirely controlled by push button. Electrically-actuated multiple-mix selectors permit the accurate weighing, batching, and recording of every load of concrete leaving the plant.

Early-morning arrivals, guests of Livingston Rock & Gravel Co., Inc., enjoy breakfast under caterer's tent before inspecting facilities of the Metropolitan batching plant (background) in downtown Los Angeles.

The company's main offices are in Long Beach, Calif. Carder B. Livingston is president and general manager; Howard Marsh, production manager; and Ed Misenheimer, chief engineer. Besides the new Metropolitan plant, the company operates batch plants in Artesia, Long Beach, and Montebello. Sand, gravel, and crushed-rock plants of the company are located in Azusa, Corona, Monterey Park, Sunland, and Palos Verdes.

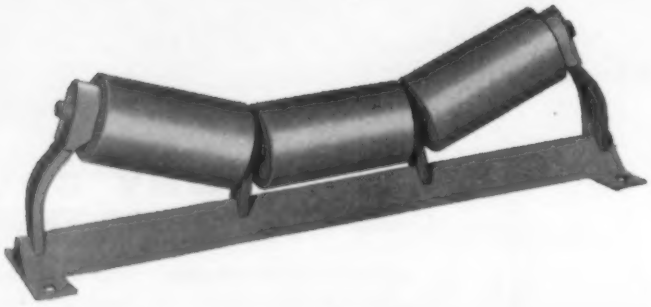
Concrete Block Operators Form South Carolina Assn.

With a view toward improving service to builders and the quality of concrete masonry in South Carolina, the South Carolina Concrete Masonry Association was recently formed as a statewide organization by approximately 25 member companies.

Sam Green of Rock Hill Concrete Company was elected president; H. L. Saltonstall of Tidewater Concrete Pipe and Block Company, vice-president; and W. A. Foster of Palmetto Quarries Company, secretary-treasurer. These officers, with Roy Pennell Jr. of Spartanburg Concrete Company and H. A. McGee of Farmer's Concrete Company, constitute the board of directors of the new association.

Herry B. Tellyer, president of the Tellyer Concrete Pipe Co., Albuquerque, N. M., has been elected to a three-year term as a director of the Western Concrete Pipe Association.

6 SOUND REASONS FOR USING MARCO BELT CONVEYOR IDLERS



PRECISION GROUND BALL BEARINGS
Every bearing used in MARCO Idlers are made with the same accuracy and skill as precision automotive bearings.

EFFECTIVELY SEALED
Each bearing is "unit sealed" to eliminate separate closure parts, retain lubricant and keep dirt out.

PRE-LUBRICATED
All bearings are factory packed with special grease to eliminate further lubrication in the field.

BEARING SHIELD
A formed steel deflector prevents entrance of material between end rolls and brackets for longer roll life.

ALL STEEL FRAME
Provides greater strength than castings. Self shedding base prevents roll clogging from material build up.

COMPLETE LINE
MARCO offers perhaps the finest, most complete line of ball bearing conveyor idlers available to American industry today!

MARCO dealerships are available in some areas.
Your inquiry will receive prompt, confidential attention.

OTHER MARCO PRODUCTS
• Tubular Frame Belt Conveyors
• Bucket Elevators • Control Gates
• Feeders • Bins • Solid and Self-cleaning Pulleys

E. F. MARSH ENGINEERING CO.
ST. LOUIS, MISSOURI

1st N.C.M.A. State Chapter Formed by Nebraska Group Accepted by Directors

The recent acceptance of the Nebraska Concrete Masonry Association as a state chapter of the National Concrete Masonry Association was an important event, since it gave N.C.M.A. its first state affiliate.

Upon presenting its application to the national organization for affiliation, the Nebraska group proved that all of its members were also N.C.M.A. members. All conditions established by an N.C.M.A. committee on eligibility for local, state, and regional affiliation were met, and the board of directors at its mid-year meeting accepted the Nebraska association as its first chapter.

S. E. Regional Meeting of A.C.I. To Be Held Oct. 31-Nov. 1

The American Concrete Institute's Southeast regional meeting will be held on October 31 and November 1, 1955, at the Atlanta Biltmore Hotel, Atlanta, Ga.

The tentative program includes the following subjects: construction of the Dauphin Island bridge and Lake Pontchartrain bridge, thin-shell precast concrete, silicone water repellents for masonry, lightweight aggregate concrete, concrete masonry wall construction, cracking of masonry walls, concrete stress distribution in flexure, diagonal tension, and concrete shear strength.

Co-chairmen for the event are William H. Armstrong, structural engineer, Atlanta, and William R. Ireland, president, Atlanta Aggregate Company, Inc., Atlanta.

Southern Block & Pipe Corp. Installs Steam Curing System

A $250,000 high-pressure steam curing system for "Solite" and concrete masonry blocks has been put into operation at the Southern Block and Pipe Corporation (a subsidiary of Southern Materials Company, Inc.) located at Norfolk, Va.

An autoclave 128 ft. in length and with an inside diameter of 7 ft., is used. Richard C. Goodman, secretary-treasurer of the firm, said more than 18 months of research and study preceded the development of the process.

W. Moeller Named President Of Davenport Block Firm

Walter W. Moeller, executive secretary of the Master Builders of Iowa, Des Moines, for the last 10 years, is the new president of the W. G. Block Company, Davenport, Iowa.

The retiring president, C. A. Mainwaring, becomes chairman of the board to succeed Fred O. Block, who is retiring from active duty.

Mr. Moeller was with the Dewey Portland Cement Company for 20 years before joining the Iowa state builders' organization. Other officers of the firm named included J. R. Northington, executive vice-president; M. M. Tiedemann, secretary; and R. B. Swift, attorney and director. Vice-president of Davenport operations is E. W. Mainwaring.

Dillingham Named Head Of New Canadian Firm—Dilco Concrete Products

Appointment of F. H. Dillingham as president and managing director of Dilco Concrete Products Ltd., a newly-formed company which has purchased the cement block business of H. J. O'Connell Cement Products, Montreal, Can., has been made.

Other officers of the new concern include R. W. Wakefield, treasurer; and Commander F. W. R. Angus, O. K. Ross, and Lawrence T. Porter, directors.

EXPAND *your* LINE • *your* SALES • *your* PROFITS *with the*

KENT LINTELATOR

Give your business a boost by supplying an additional badly needed product.

Produce high grade, reinforced concrete lintels up to 10′8″ long from any aggregate, at high speed and low cost.

Sell them on almost every order for blocks at prices that assure a nice profit.

You can do just that with this New Kent Lintelator, which is thoroughly proved and definitely successful. Some blockmakers have two or three in operation.

Despite the existence of a great market nothing like this practical and profitable machine has ever been available before.

Expand your sales and profits. Be first in your field to supply this needed item. Use it as a lever to interest new customers you have ever been able to sell. Write for literature.

The KENT MACHINE COMPANY

CUYAHOGA FALLS, OHIO

CONCRETE PRODUCTS MACHINERY SINCE 1925

Canadian Distributor: Wettlaufer Equipment, Ltd., 49 Merton St., Toronto 12, Ontario

Concrete Industries Trade Notes

Exclusive sales and parts service of C. S. Johnson and Kwik-Mix construction equipment in northern Louisiana will be handled by a newly appointed distributor, Contractors Equipment Co., Monroe, La.

The firm is headed by C. K. McClure, president and general manager; C. E. Burton, sales manager; and M. H. Goddard, service manager.

W. E. Putz

Barber-Greene Company has announced the appointment of W. E. "Ned" Putz as advertising manager for the firm. He succeeds Wayne D. Adamson Jr., who has resigned to accept a similar post elsewhere.

Mr. Putz was formerly head of the Barber-Greene Company's literature division.

Three promotions and one appointment have been announced by officials of the Stearns Manufacturing Company, Inc., Adrian, Mich.

Myron Hultmark, vice-president and general manager of Stearns since 1948, has been promoted to president and general manager; M. F. Ledford, sales manager since 1953, was advanced to distribution manager; and John L. Tuttle, formerly assistant sales manager, was named sales manager.

Myron Hultmark

Mr. Hultmark was associated with the American Aggregate Company and later with the Missouri State Highway Commission. During World War II he served as an industrial specialist of the concrete products division of the War Production Board. He joined Stearns in 1948.

M. F. Ledford

J. L. Tuttle

Mr. Ledford in the earlier years of his career was employed by the Anchor Concrete Machinery Company. He had been associated with Stearns since 1934.

Mr. Tuttle joined the firm in 1944 after having served various manufacturers in a sales capacity.

The new appointment announced was that of David H. Densmore, who was named to the Stearns sales staff, to represent the firm in Georgia and Florida.

LOOK! Only... $1,015 F. O. B. CUBA, MO.

... opens a new road to new profits for you!

Block plant operators everywhere are turning to a *new* horizon of greater profit . . . *split block* . . . easily produced on the FLEM-STONE in a wide variety of eye-appealing and permanent colors. If you want *your* share of this profitable market, then the new, rugged FLEM-STONE block splitter is for you. Accommodates block slabs up to 24" wide, 8" high.

Because of its simple, cam-principle design, the FLEM-STONE is priced from $500 to $2,000 *less* than other comparable machines. Mechanically powered, it is shipped complete—ready to operate. Immediate delivery. Write for full information today!

MAIL TODAY!

FLEMING

MANUFACTURING CO.
489 FLEMING AVE.
CUBA, MO.
PHONE: CUBA 400

Gentlemen: Please rush complete information, including specifications, prices and terms on the low-priced FLEM-STONE block splitter.

Also request information on:

- ☐ Automatic Double Block Machine
- ☐ FMC-180 Fully Automatic Concrete Block Machine
- ☐ FMC Stationary Mixers

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Name_____
Firm_____
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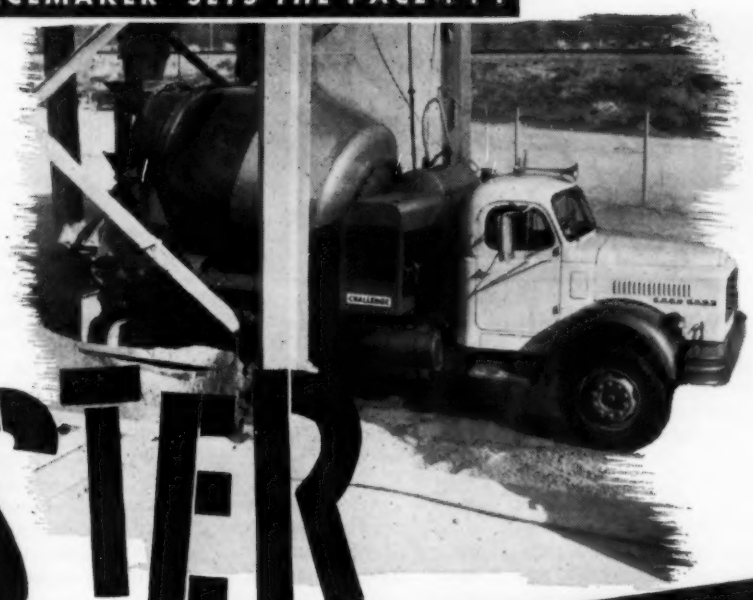
CHALLENGE PACEMAKER* SETS THE PACE . . .



FASTER

. . . under the plant

. . . on the job

FASTER CHARGING

The "Pacemaker" charges as fast as your plant will deliver. The blades are located in the drum to take in material faster than ever before . . . as fast as 7 seconds per yard under some plants. AND **without blow-back.**

New 2-speed operation gives greater operating flexibility. A high speed gear, teamed with a new blade and hopper design, revolves the drum at proper speed for fastest charging. An intermediate gear provides a wider range of mixing and slow agitating speeds to meet ALL job requirements.

FASTER, SMOOTHER DISCHARGING

New "L-Shape" Discharge Blades, together with the **just right** 16° drum angle, and large rear opening, team up to discharge concrete in record time. Two exclusive secondary discharge fins in the rear cone section of the drum, smooth out the flow of concrete and eliminate "surging", assuring **positive** discharge control. (Being bolted in position, each fin is easily removed for continuous type pours of low slump concrete.)

Performance tests made with the "Pacemaker" in direct competition with other "current production" mixers, give conclusive proof of Challenge superiority.

We'll Be Glad To Prove It!

Your nearest Challenge dealer is prepared to prove by actual demonstration on **your** job, with **your** crew, under **your** plant, that the new "Pacemaker" OUTPERFORMS ALL OTHERS.

Make arrangements for a demonstration TODAY!

COOK BROS. TRUCK EQUIPMENT

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*** VALUE STANDARD OF THE INDUSTRY**

R/y Ready Mix

By Harry F. Thomson

Winter Operation May Be Tricky

ONE of the significant contributions of ready-mix to the construction industry has been the ability to deliver concrete in warm condition during cold weather. In general, concrete which has a temperature of 60 deg. to 80 deg. when placed and which is given protection commensurate with the severity of air temperature, will develop strength at approximately a normal summer rate. Wood forms have considerable insulating value. In fact, except in extremely cold weather, protection can be removed after about 72 hours and the condition of the concrete can be all but forgotten. Accordingly, the concreting operation can proceed on schedule, avoiding the vexatious delays with the old procedure of placing the concrete cold and attempting to warm it with salamanders, and holding up other operations on the project while waiting for the concrete to develop reasonable strength.

As a result of the growing trend toward using warm ready-mix, a much larger proportion of a community's annual construction is now handled during the winter than was the case formerly. This partial filling-in of the "valley" of the construction curve is beneficial to all concerned, including building owners, contractors, labor, and of course the concrete and other material factors. Even sidewalk and other slab-on-ground work can be handled during a period of mild freezing if the urgency justifies the moderate expense of insuring that there is no frost in the sub-grade.

The *Recommended Practices for Winter Concrete Methods* of the American Concrete Institute (A.C.I. 604-48) suggests that protective measures be taken "whenever it is anticipated that the air temperature at the point of placement is likely to fall below 40 deg. F. during the 24-hour period after placing concrete." The protective measure of warm concrete offered by the ready-mix producer can be obtained with hot water at a temperature of 125 deg. or higher for air temperatures down to 40 deg. or immediately below. Water at higher temperature, up to say 175 deg., should be used for air-temperatures below 40 deg. and down to about 25 deg., as at that temperature the aggregates will seldom contain troublesome amounts of frost. For temperatures below 25 deg. it becomes necessary to heat aggregates.

Probably the nearest to a satisfactory method of heating the necessary hot water is through a large storage tank equipped with a heat-exchange coil or set of tubes fed with live steam. The water temperature can be controlled by an adjustable thermostat-valve which cuts off or admits steam to maintain the desired temperature. Thus at the morning start the full tank of hot water is available. But if the water is used faster than the rate of recovery from the heat-exchange coil, the temperature may fall gradually. A remote-reading thermometer should be available to the batcher-man to inform him of the temperature of the water being charged to the batch. A cold water line should also be available in order to reduce the temperature of water for a given batch if necessary.

In some plants water heating is handled by running live steam into the water, either in the batch or in an open tank ahead of the batcher. This method wastes steam and may create objectionable vapor in the batching area. Some producers use special types of mixing valves for bleeding steam into the water line leading to the water-batcher.

A very important "must" in using hot water is to avoid permitting steam to come in contact with the cement, because the cement may begin to set rapidly. Even a flash set may occur. The heated mixing water

COMPLETE PLANTS from a Single Source

- "Tilt-Up" Mixers
- Ready-Mix Plants
- Expressway Semi-Portable Plants
- Dry Batch Plants
- Cement Bins
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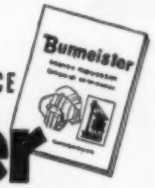
ENGINEERED TO WORK TOGETHER

From conveyor to elevator, from bin to mixer Burmeister equipment is designed and built by the same organization. Because each product is *"engineered to work together"* you are assured less costly "conversions," maximum production speed, accurate delivery of materials, and greater economy of operation. See your nearest Burmeister Distributor or write for details.

FREE CATALOG

Send for new 16-page illustrated Catalog of Burmeister Plants and Equipment.



COMPLETE PLANTS FROM A SINGLE SOURCE

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L. BURMEISTER CO., 4531 W. MITCHELL ST., MILWAUKEE 14, WISCONSIN

should be added to the aggregates so that there is opportunity for heat distribution before the cement is added.

Aggregates may be heated most readily by means of steam. Closed steam coils in the bins have an attraction because they do not waste steam and do not add moisture to the aggregates. But a relatively large storage is needed if a pour of size is to be handled because the transfer of heat to cold material replacing what is used, is slow. This is especially so with sand which is a fairly good insulator of itself. The same difficulty makes it impracticable to heat sand by ducts carrying warm air, a method which has been tried by some producers.

Heating aggregates by steam jets installed in the bins is the most common method. But with this operation the batcher-man is confronted with additional variables, chiefly the added and variable amount of moisture introduced by condensation and also the difficulty of determining the temperature of materials being batched. If the rate of batching is fairly uniform as to cubic yards per hour, an experienced operator can adjust the amount of steam through the jets to give the temperature desired in the concrete, and with fairly uniform moisture in the aggregates, the batch weights can be adjusted accordingly. But an irregular rate of delivery or long waits between loads, such as the noon shut-down, may lead to increases in moisture and temperature unless the steam flow is reduced. A sudden rush of deliveries may bring about the opposite result.

One of the most baffling situations occurs the first thing on a morning after the steam jets have been on all night or for the last hours of the night to prevent freezing; in this situation there may be an accumulation of hot condensate at the bottom of the bins. The aggregates lying in this hot water may have a temperature approaching 200 deg., which is entirely too hot to use in concrete. The remedy is to draw off such super-hot aggregates into a dump truck and return them to the yard stockpiles.

Another hazard which may result from steaming open bins for several hours during freezing weather is the formation of a frozen crust over the aggregates, which may break as material beneath is removed. Such chunks may contain a high percentage of moisture, which may quickly upset the desired quantity of batch-

With a C & W Electronic Moisture Meter you may now measure the moisture content of your sand

INSTANTLY!

ACCURATELY!

ECONOMICALLY!

YES — Its Operation Is Instantaneous
Its Readings Are Extremely Accurate
Its As Economical to Operate as a 100-Watt Light Bulb
Its Low Initial Cost Makes It Possible for Every Batch Plant to Have the Advantage of the Use of the New, Improved, C & W Electronic Moisture Meter.

Eliminate those "too wet" loads that leave your plant before your batch operator knows that there has been a moisture change.

Eliminate the time and money wasted adding water at the job site and then remixing a load on expensive truck time if the batch is too dry.

Take the guess work out of making your concrete and really have control of your slump.

Install a C & W Electronic Moisture Meter in your plant and save both time and money.

Complete with installation instructions, only $569.00 F.O.B. San Francisco.

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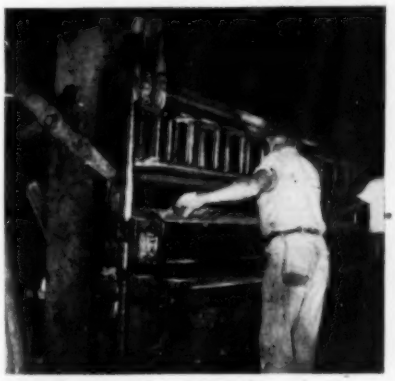
We are Associate Members of The National Ready Mixed Concrete Association.

NATIONAL READY MIXED NRMCA CONCRETE ASSOCIATION



tamping and vibrating aggregate in PreCaster mould box at plant of Bert Strickler & Son, Red Lion, Pennsylvania

"lintel production out of this world"

Seventeen months ago this Pennsylvania concrete block manufacturer found lintels a nuisance item. Now they report that using the PreCaster "profits are much higher . . . production is out of this world . . . the consumer is very happy (with the PreCaster-made lintels)" because they have given him some of the benefit of lower costs from high production.

Mr. Strickler also says: " . . . the PreCaster makes a better lintel . . . appearance can't be beat . . . customers tell us they like the texture, strength, straightness, prices . . . far below competitors who have hand-made lintels to sell."

It's time that you were enjoying the new volume and profits from the Precaster which makes *any shape that will strip through a* straight box.

Write today for catalog and prices.

PreCaster Inc. • 5217 Beech Street • Cincinnati 17, Ohio

ing water. All of this means that the batcher-man operating under these conditions must be on his toes and must exercise good judgment.

The following suggestions have been offered with reference to equipping a plant which is to operate under severe freezing conditions:

(1) The tops of the aggregate bins should be covered. (2) There should be separate valves controlling the steam jets in each aggregate bin, and these valves should be placed so that the operator can adjust the steam easily. (3) There should be arrangements for catching the drop from the aggregate bins and carrying this water away so that it will not flow into the central mixer (if used), nor into the driveway to cause an ice hazard.

A publication of the National Ready Mixed Concrete Association entitled *Cold Weather Ready Mixed Concrete* contains basic calculations for boiler capacity needed for heating water and aggregates under different conditions. The approximate results are as follows:

Water — one boiler horsepower (33,500 B.t.u. per hr.) will raise, per hour, about 300 lb. of water (36 gal.) about 100 deg. F.

Aggregate containing 4 percent moisture—one boiler horsepower will raise, per hour, one ton, when above freezing, about 60 deg. to 65 deg.

Or the same one ton of aggregate per hour, if frozen (*i.e.* with moisture in the form of ice), about 30 deg. to 40 deg.F.

These rough estimates indicate that the required boiler capacity *per cubic yard of concrete per hour* will range from about one horsepower for mild weather climate to about 2½ horsepower for reasonably severe winter weather. These figures are based on the B.t.u. requirements to raise the temperature of the materials themselves, and do not include the heat losses to the air. These losses might make necessary an increase in capacity of 25 percent or greater, depending on conditions. Steam for space heating, like the office, shop, garage, and batching area, would also be additional.

It has been stated above that, if placed at "normal" temperature of about 70 deg. during freezing weather and if given reasonable protection, concrete will set at substantially the normal rate, *i.e.*, for an average cement, initial set in approximately 3 hours and final set in approximately 6 hours. For most construction (exceptions might be thin sections or air temperature below 10 deg.) this timing will permit development of sufficient strength to resist freezing by the time the temperature of the mass may have fallen to 32 deg. Accordingly, it is seldom necessary to add an accelerator to warm ready-mix.

The most commonly used accelerator is calcium chloride, usually in the proportion of 2 percent of the weight of cement. When so used, at normal temperature, the time of initial set is reduced to approximately 1 hour, and the final set to approximately 2 hours. This time of gaining strength which will resist freezing is advanced similarly. Tests on 1-2-4 mix reported by the Highway Research Board indicated that the addition of calcium chloride more than doubles the 1-day strength, and produces subsequent gains of 51 percent at 3 days and 32 percent at 7 days.

Unfortunately, the role of calcium chloride in preventing frost damage is widely misunderstood. Calcium chloride and proprietary articles in which it is the chief ingredient, are not anti-freeze materials. A solution of the concentration by the usual 2 percent $CaCl_2$ has a freezing point only about two degrees below that of water. Actually, calcium chloride should be considered as an accelerator to hasten the hardening and to give an early strength to the concrete.

If calcium chloride is to be used, it is preferable to add it in solution to the mixing water to insure uniform distribution. A convenient concentration is 1 lb. per quart of solution. Care should be taken that the cement does not come in contact with the chloride solution, as a flash set might result. Also, the length of haul, possibility of delays, and the temperature of the concrete being hauled should receive very careful consideration. The 2 percent solution should be used only for prevailing temperature up to about 70 deg., as there should then be no difficulty with discharge or placement within 1 hour; for temperatures between about 70 deg. and 90 deg., 1½ percent is recommended as maximum; and for temperatures over 90 deg. not more than 1 percent. However, except when routine operation within safe limits is assured, it would be conservative to introduce the calcium chloride just before the discharge of the concrete, allowing additional mixing to incorporate thoroughly the admix throughout the batch.

These considerations—the influence of temperatures of aggregates and mixing water; the possibility of additional moisture in aggregates heated by steam jets; the action of calcium chloride added to the mix; and the chance that any considerable deviation from established procedure may bring dire results in the way of a too-early set—all lead to the conclusion that winter production of ready-mix may be tricky business. Even so, however, the undertaking of continued production during cold weather is strongly indicated.

Southern Materials Company Reports Record Sales, Earnings

Net sales of $9,926,000 for the fiscal year ended May 31 established a record high for Southern Materials Company, Inc., of Norfolk and Richmond. This figure represents an increase of 13.4 percent over sales of $8,750,000 for the previous year.

Net income also was at a new high of $838,000, equivalent to $1.31 a share based on average shares outstanding. This compares with $701,000 and $1.12 per share last year.

During the year, the company acquired three ready-mixed concrete plants at Virginia Beach, Hampton, and Lee Hall, Va. All the outstanding stock of Southern Block and Pipe Corporation, of Norfolk, also was acquired.

Two Cleveland Pipe Concerns Name Newly Elected Officials

Officers of two Cleveland, Ohio, firms, Universal Sewer Pipe Corporation and United States Concrete Pipe Company, were elected at a recent meeting of the board of directors in Cleveland.

R. F. McFall, president, announced the new officers of the companies as follows: S. O. McFall, chairman of the board; R. F. McFall, president; R. H. Exley, executive vice-president and treasurer; J. J. Satow, secretary; and H. B. Bodenhamer, general sales manager.

The claim for a world's record in the placement of concrete has been made by Herman Ellis, member of the Mackinac Bridge Authority, Sault Ste. Marie, Mich. Mr. Ellis cited for comparison the 6,250 cu. yd. of concrete placed in 24 hours in the construction of the $100,000,000 Straits Bridge being built between Michigan's two peninsulas.

DOW

CONCRETE SETS 100% TO 500% FASTER WITH DOWFLAKE ADDED

Transit-mix manufacturers find 25-lb. bag an accurate measuring unit

Concrete construction is high-speed production. But an outmoded process can wreck tight schedules. Days are lost. Labor idles. Dowflake® (Dow calcium chloride 77-80%) is one way to insure fast work. Setting time is a case in point. At 25° concrete takes 6 weeks to reach a strength of 2000 psi. Time is wasted. Costs go up. Add 2% of Dowflake and time is slashed to 7½ days. Concrete is more workable. Its ultimate strength is greater. At any temperature it will set stronger faster with Dowflake.

With the 25-lb. bag you can add Dowflake with ABC simplicity. Human error is virtually eliminated. Just add one bag to a five-yard batch (five bags cement per yard) to obtain 1% Dowflake. Two bags for 2%. It's fast, light work and can be done at the plant or on the job site. No loss through spillage. No awkward bucket measures to handle. No wonder the 25-lb. bag is becoming so popular.

Keep ahead of tight schedules. Increase concrete strength and setting speed. Do it the easy way with Dowflake in the 25-lb. bag. Write to THE DOW CHEMICAL COMPANY, Dept. IN 911T, Midland, Michigan.

you can depend on DOW CHEMICALS

DOW

Pipe Firm Adds Precast Concrete Roof Tile Plant

Effectively utilizes high insulating qualities of vermiculite

another P and Q exclusive

IN Pittsburgh, Pa., the Neville Concrete Pipe Company has expanded its operations by opening one of the most modern plants in the industry for the manufacture of precast vermiculite insulating concrete roof tile. Engineered for a potential capacity of 80,000 sq. ft. of tile a month, the new plant occupies one end of an existing building adjacent to the firm's pipe fabricating plant on Neville Island.

"We think this short-span roof tile has a good future," W. G. Ramsey, president, commented. "The combination of insulation with structural strength gives the owner a fireproof deck with one application, and it's an ideal material over factory areas where so many acid fumes are a problem. The units are light enough for one man to handle easily, and they can be installed in any season."

Cast individually, each slab is 18 in. wide, 36 in. long, and 3 in. thick. Reinforcing, 2- by 4-in. by 12-gauge galvanized steel mesh formed into a basket shape, provides greater structural strength. The tile has a "U" value of .22, weighs only about 10½ lb. per sq. ft., and can support a total load of 50 lb. per sq. ft. with a safety factor of 4.

A scene in the Neville pipe plant. The tile proceeds by dragline to the push-out machine (center), then to the scoring and bevelling machines. Empty forms go via sloping roller conveyor to the beginning of the line, where they are cleaned. Note the shaping and cutting machine for reinforcing mesh (left foreground).

The underside is finished in an attractive swirl pattern that has good acoustical value. Water paint can be applied without impairing this acoustical efficiency; consequently, an additional ceiling is often unnecessary either for appearance or sound control.

The efficient Neville operation was adapted to a balcony type building three stories high. With 30,000 sq. ft. of floor area, it has a great deal of "elbow room" and storage space. The main floor, where the tile is made and cured, measures 80 by 100 ft. The two balcony levels, connected with the main floor by ramp, are used for the mixing operation and for materials storage.

The concrete is mixed on the first balcony in a 36-cu. ft. Besser mixer which discharges into a hopper directly over the main floor assembly line. At present the mixer hopper is charged manually on the second balcony, but bins will be installed when production hits its stride.

The assembly line starts when the steel pan forms are placed on a roller conveyor and greased with special oil blended in the plant. Inside dimensions of the pans are the same as the finished tile. The bottom, or pallet, is removable.

As soon as the form is greased, it

Rugged Y-260 speeds yard operations at Sherman Concrete Pipe Co., Knoxville, Tenn.

Sherman Concrete Pipe knows . . .

BIG LOADS MEAN BIG PROFITS

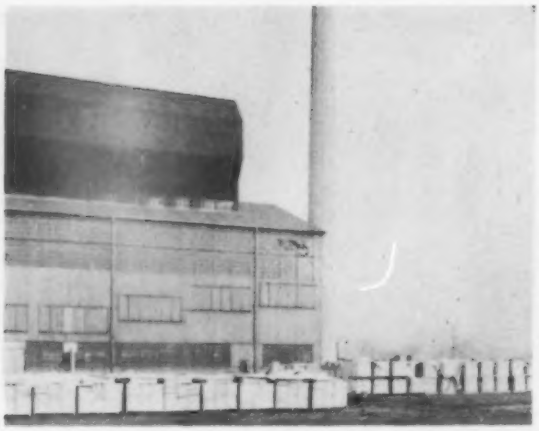
Concrete pipe with diameters of 7 feet, and weighing 20,000 lbs. is a big load . . . calls for big, rugged equipment. Sherman Concrete found the Clark-Ross Y-260 met the test—released 8 to 10 men for more productive work, speeded operations, increased their profits.

Rugged terrain, mud, bad weather are no problem for the Clark-Ross Y-260. Balanced weight distribution and large sized tires guarantee positive traction. Low center of gravity combined with a high under-clearance of 10" gives exceptional operation on rough terrain. And for maneuverability the Y-260 can't be beat. The shaped rear counterweight of the Y-260 is especially designed to reduce overhang in turning, to give a minimum of tail swing.

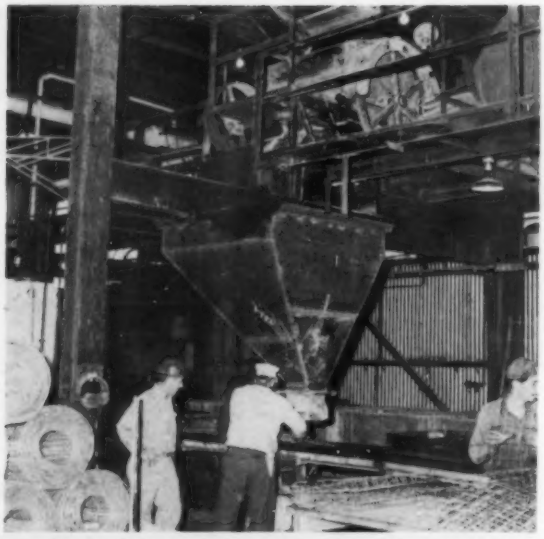
Here's a truck that offers outstanding traction and maneuverability . . . with big load capacity. Call your local Clark dealer for details on how the Y-260 can increase profits in your operations. He's listed in the Yellow Pages under, "Trucks, Industrial."

CLARK EQUIPMENT

Industrial Truck Division **CLARK EQUIPMENT COMPANY** Battle Creek 90, Mich.



Above: Exterior view of the Neville tile plant and yard, with vermiculite roof tile curing in foreground.



Right: The mixer on first balcony discharges vermiculite concrete into a hopper directly over the main floor assembly line.

moves on to the next workman, who inserts the basket-shaped reinforcing mesh, machine-cut and shaped nearby. The forms move along at a speed of 120 per hour to the concrete hopper, where they are filled and vibrated for 30 seconds; then they move under a fixed screed.

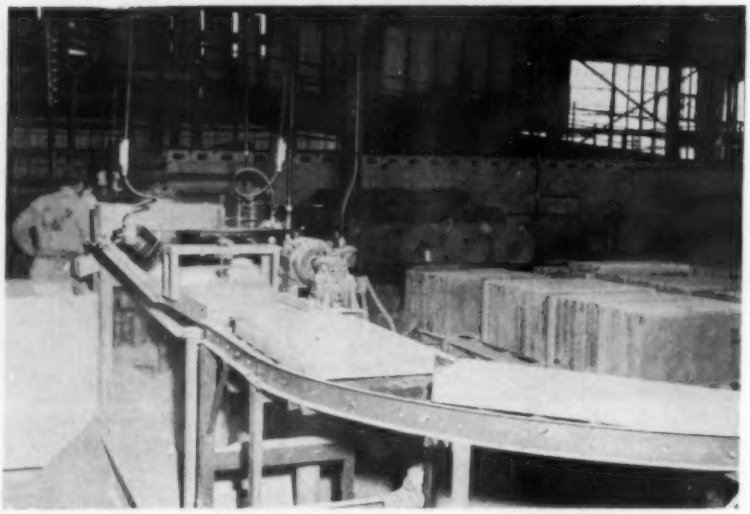
At the end of the line the tile is taken off by a hydraulic handling device. It is stacked on carts running on tracks into a kiln only 3 ft. away. There are three sets of these tracks. The kiln measures 15 by 45 ft. and has a capacity of 1,000 tile. The walls are concrete block and the top is lightweight concrete plank. There are overhead plywood doors at each end. Inside the kiln on the floor between the tracks are steam heating pipes and fins that radiate dry heat upward.

The tile cures at a temperature ranging from 150 to 160 deg. until the following day, when the carts are pulled out of the kiln at the opposite end. Another hydraulic handler places the forms on a chain dragline which pulls them up a slight decline to the push-out machine; here the tile and pallet are pushed upward out of the form. The pallet drops back into the pan, which proceeds by gravity down an inclined roller conveyor to the cleaning point and returned to the assembly line.

The tile itself moves on by conveyor under a scoring machine, where the top is swirled. (This, of course, is the under side when the tile is installed.) The unit continues to the beveling machine for removal of sharp edges and to a rotary brush for cleaning.

At the end of the conveyor the

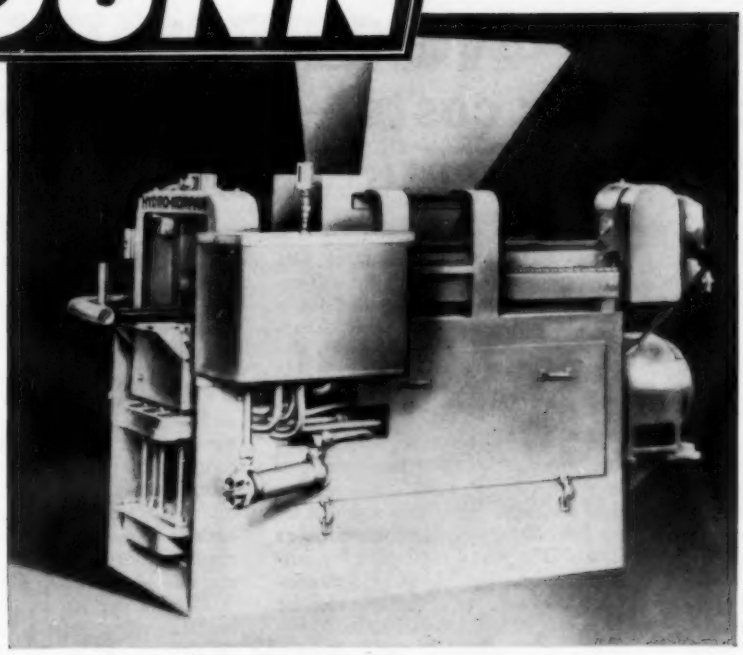
(*Continued on page* 252)



Sharp edges are removed by the beveling machine, and the tile moves on to a rotary brush for cleaning.

Finished units at the end of the line. Right: Guy Ramsey, president of Neville Concrete Pipe Company; Left: Paul W. Sylvester, Pittsburgh district manager, Zonolite Company, vermiculite miners and processors. Mr. Sylvester is pointing to the swirled surface which will appear on the ceiling after installation.

DUNN



HYDRO-KORPAK BLOCK MACHINE

Priced to fit modest budgets, the Hydro-Korpak brings the production economies and operating efficiency of advanced engineering within easy reach of average sized plants, or those with normal sales potentials. Its design is based on 50 years of block-machine building.

Two-way packing—vertical and lateral—results in blocks of extreme density and superfine quality. It's unique with Korpak, because only Korpak has oscillating cores.

1-man operation . . . hydraulic movements . . . electrical controls. 2¼ tons of machine self-contained to occupy only 33 square feet of floor space. Available on sale or lease.

Direct-to-user selling through factory demonstration, with resultant savings passed along to owners. You are invited to Holland—as our guest—to see the machine in operation and get information first hand. Meanwhile, write for descriptive catalog.

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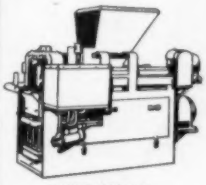
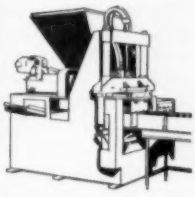
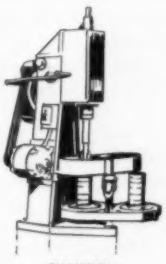
KORPAK BLOCK MACHINE



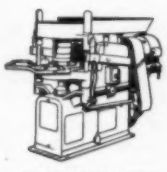
HYDRO-KORPAK BLOCK MACHINE



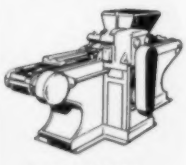
TWIN-PAK BLOCK MACHINE



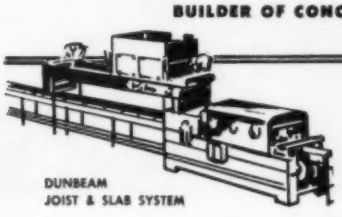
CHAMPION DRAIN TILE MACHINE



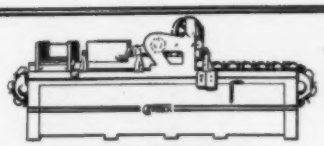
DUNN "AUTOMATIC" DRAIN TILE MACHINE



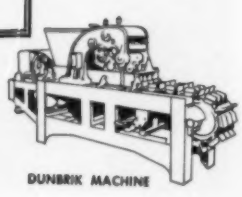
DUNTILE MACHINE



DUNBEAM JOIST & SLAB SYSTEM



CAVITEX MACHINE



DUNBRIK MACHINE

Concrete Wall Panels

Modern Crete lightweight panels cut labor costs — can be worked like lumber

A NEW and interesting adaptation of lightweight concrete wall panels that has already proven successful in industrial, commercial, and residential installations came to our attention recently. Modern Crete meets the modern demand for reduced time of installation —the greater portion of construction costs today—while providing a wall strong enough to support the roof load. These panels have sufficient insulation qualities, which offers a low material absorption or a high resistance to moisture penetration.

A development of Modern Crete, Inc., of Flint, Mich., the panels are already being produced by licensed manufacturers in many places in this country and Canada. The manufacturer claims that the material can be sawn, nailed, or otherwise worked like ordinary lumber. On typical installations to date it is claimed that savings in on-the-job labor up to 73 percent can be made over wood frame construction.

Modern Crete panels have been successfully used for load-bearing walls in one-story and story-and-a-half residences, and for curtain, spandrel, and interior partition walls in industrial buildings. The latter application is particularly adaptable where a fireproof demountable partition is demanded. Recently, a four-hour fire rating was obtained for a wall using the two-panel construction with an air space between the two 2-in. thick panels.

No special equipment is required to install Modern Crete panels. Weighing only 140 lb. each, they can be set in place by two men, can be readily cut to accommodate window and door openings, and can be set horizontally with reinforcing, as lintels. The usual methods of painting or otherwise decorating the concrete surface for exteriors can be followed with the panel units.

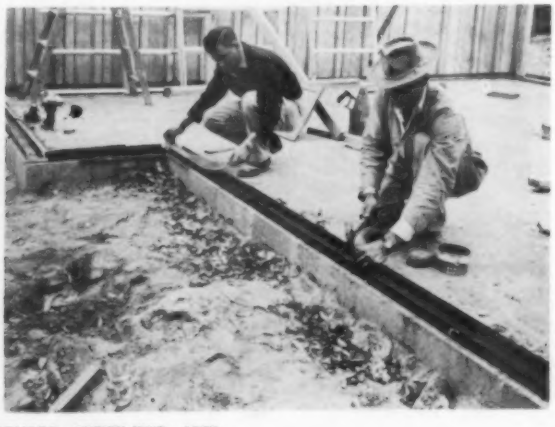
Major equipment used in the manufacture of the panels consists of a mixer, a vibrating table for the consolidation of the concrete, and special metal forms, plus curing facilities generally found in all concrete products plants. According to the manufacturer, the concrete is made of inorganic materials, the aggregates being expanded blast-furnace slag, expanded shale or certain pumices, combined with a mixture of vermiculite, oil, and portland cement. They are cast with a 3½-in. slump in metal molds specially oiled and vibrated to create a marble-like finish on one side of the channel-shaped slab sections.

Mesh reinforcing is placed in the molds before casting, to provide the necessary flexural strength. Standard panels are 8 ft. long and 16 in. wide, although other sizes are made for fillers or to meet special requirements. Thicknesses vary from 2 in. to 5¼ in.

Originally, the panels were made with tongue-and-groove sections, but the present channel section was found to be more satisfactory for the interior installation of metal lath and plaster and for dry-wall applications of wall boards, etc. The concrete weighs from 80 to 90 lb. per cu. ft., has a permeability rate of 0.081 gal. per sq. ft. per 24 hours, an absorption rate of 13.3 percent by weight, and in the sample tested showed a bond strength with reinforcing of 356 p.s.i.

Other descriptive test data submitted by Modern Crete include the axial compression loading of one panel over the end net area of 42 sq. in. This sustained a load of 62,550 lb. (1,490 p.s.i.) before failure. Similarly, a transverse loading of 57 lb. per sq. ft. was sustained by the panel when tested as a slab. The conductivity "k" of the concrete per inch thickness for dry condition was reported as 2.0 B.t.u. per hour per deg. F. per sq. ft., with an overall

The mixer, vibrating table, and forms used in making Modern Crete wall panels.

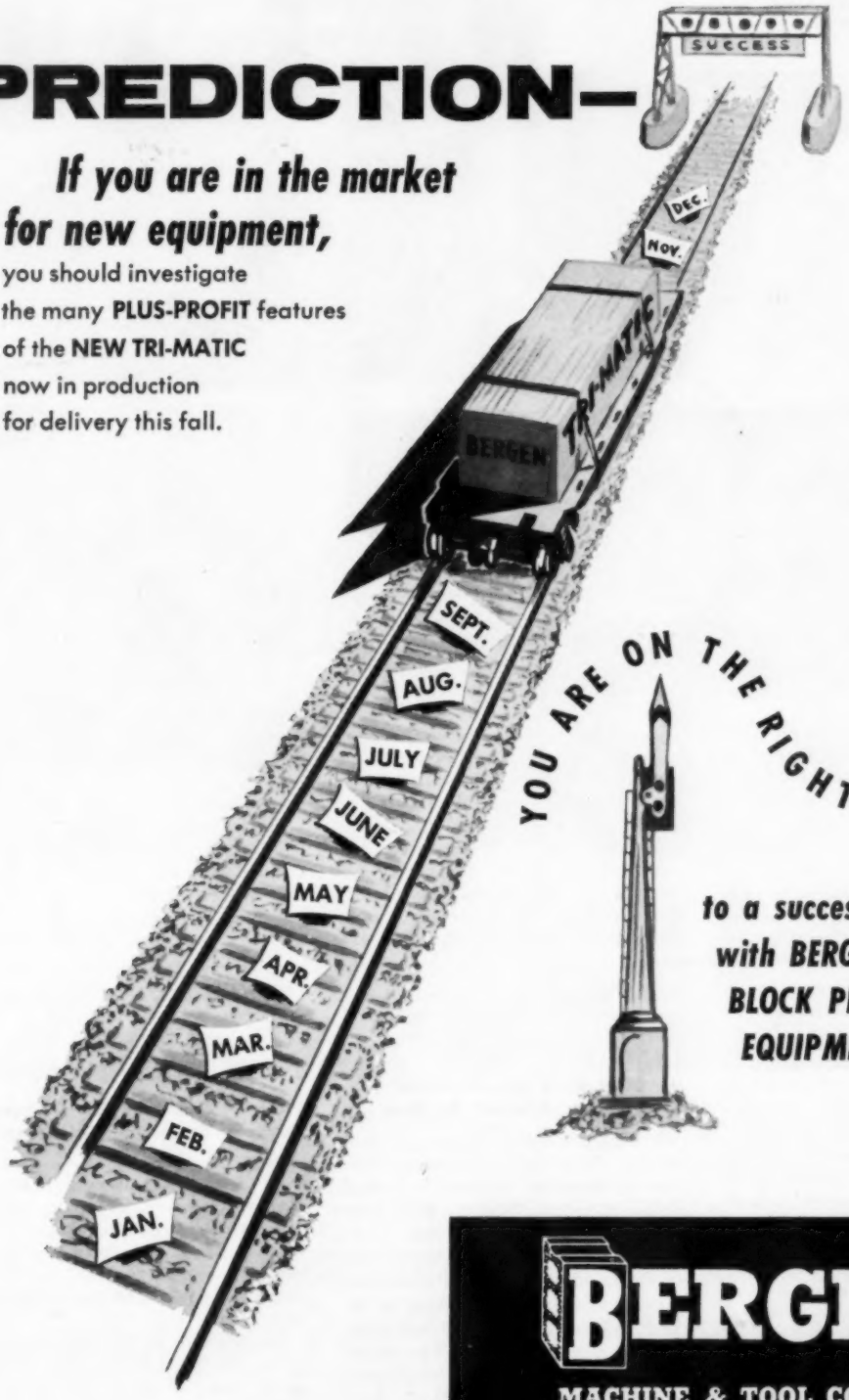


Steel channels are first fastened to the foundation or floor, to provide template and securing of wall panels at the base.

PREDICTION—

If you are in the market for new equipment,

you should investigate
the many **PLUS-PROFIT** features
of the **NEW TRI-MATIC**
now in production
for delivery this fall.



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to a successful future with BERGEN BLOCK PLANT EQUIPMENT

BERGEN

MACHINE & TOOL CO., INC.
NUTLEY, N. J.

Cable address: "BERGENCO" (NUTLEY, N. J.)

Right: A corner panel is inserted in the channels and standard wall panels are placed in position on either side.

Extreme right: Channels are nailed to the panels to form a rigid frame.

Below, right: Caulking is applied both inside and outside with a gun.

Below: More than one mile of Modern Crete panels form a parapet wall on the $25,000,000 Northland Shopping Center built by the J. L. Hudson Company of Detroit, Mich.

coefficient of heat transmission "U" of 0.155 B.t.u. per hour per deg. F. per sq. ft. of wall using reflective aluminum foil, ¾-in. furring strips, and ⅜-in. Sheetrock board.

Installation begins with the bolting of steel channel sections to the outer edges of the foundation walls or floors; the ends of the wall panels are then set into these channels and held in place by nails driven through holes in the steel channel legs and into the wall panel concrete. A similar channel is placed along the top of the wall to hold the panels in alignment. Steel roof trusses can be welded to the top steel channels or wood roof framing can be nailed through the channel into the panel concrete, to start a frame roof. Sealing between the panels is accomplished by the application of a special mastic used at the joint on the outside with a caulking gun. Where the Modern Crete panels join on the inside, oakum and mastic is similarly applied along the joint line.

Frank D. Davis Company Opens New Jersey Branch

The Frank D. Davis Company, producers of dry colors and pigments for the concrete industries, has opened a plant, warehouse, and sales office in New Brunswick, N. J.

The new eastern branch is fully co-ordinated with the Los Angeles headquarters, and the same line of colors is now available at both places. In addition to the large inventories carried at the New Brunswick and Los Angeles plants, the company also maintains warehouse stocks in strategic distribution points throughout the country.

Mailing address of the New Jersey office is P.O. Box 292, Nixon, N. J., with Paul Raber in charge of sales. General management continues under the direction of Frank D. Davis, who will maintain his headquarters in Los Angeles, and whose 32 years of experience in the color and pigment field is at the disposal of those concerned with the problems and application of color in concrete.

G. Magnel Dies—Invented Belgian Prestressed System

Professor Gustave Magnel, inventor of the Belgian system of prestressed concrete construction, died July 5 at Ghent, Belgium, of a heart attack. He was 65 years old.

Prof. Magnel applied the system to the building of bridges in various countries; among his designs is the Walnut Lane Bridge in Philadelphia. He was a graduate in civil engineering from the University of Ghent, and was appointed a professor there in 1937.

Among his awards was the Frank P. Brown Medal of the Franklin Institute of Philadelphia. He held membership in the American Society of Civil Engineers, the American Concrete Institute, the American Society for Testing Materials, and the Institution of Military Engineers of the United States.

Hallett Construction Company Buys G. C. Hubbell Interests

Sales of the Grover C. Hubbell sand and gravel interests and the Crown Concrete Company to the Hallett Construction Company of Crosby, Minn., has been jointly announced by Mr. Hubbell and E. W. Hallett, president of the latter company.

In addition to the concrete company, the Coon Valley Gravel Company, and two other pits, all in the vicinity of Des Moines, were involved in the transaction. Plans for expansion of the properties were announced by Mr. Hallett. R. V. Roupe, president of Crown Concrete, will continue as general manager in charge of sales and properties.

More ready mixed concrete is sold in JAEGER truck mixers than by any other method

SMALL PLANT SOON NETS 10%: In this grass-roots town of 12,000 population (name on request), they started just 2 years ago with 3 used Jaeger truck mixers and a 60-ton, two compartment bin with 3 yd. weigh batcher and bucket elevator. One mixer was a 3 yd. on GMC single axle truck, the others were old 2 yd. units on K-6 Internationals. With this equipment they were able to reach a top production of 247 yds. in one day, on a 2700 yd. sewage disposal plant.

Their first truck mixer bought new was a Jaeger 4½ yd. "Mix Plus" model on T800 Ford. Bought for a 2300 yd. curb and gutter job, this new mixer poured a steady 10 yds. an hour, including 3-mile trip. Their next purchase will be a matching 4½ yd. giving them a fleet of two 4½ yds., one 3 yd. and a 2 yd. standby — all Jaegers and all profitable. Their total investment, to date, is approximately $60,000 including inventory. Started in June, 1953, this business quickly began to show a profit. For the year 1954, their net return on investment, after depreciation and all charges, was a tidy 10%.

More ready mixed concrete is sold in Jaeger truck mixers than by any other method. Ask your Jaeger distributor to show you why, or write us for complete information.

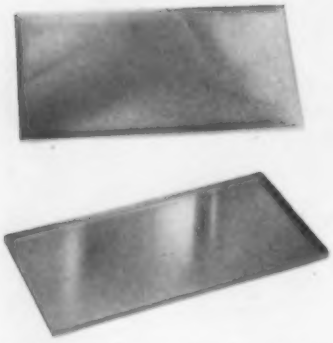
THE JAEGER MACHINE COMPANY

602 Dublin Avenue, Columbus 16, Ohio

LOADERS • COMPRESSORS • PUMPS

CONCRETE MIXERS • PAVING MACHINES

INCREASE YOUR DOLLAR VOLUME
with these New Lines

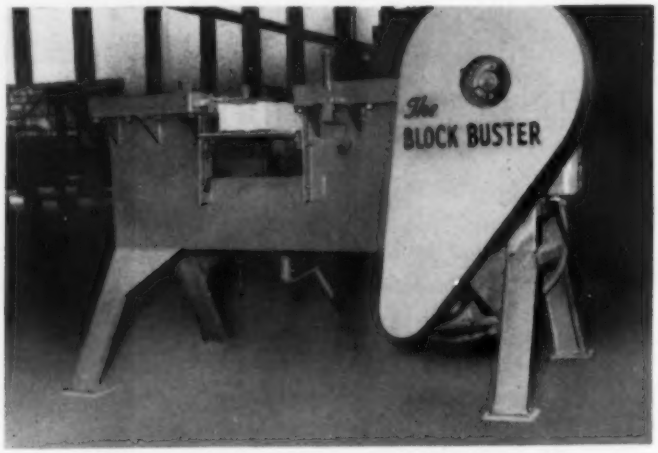


Add new beauty to the concrete block B&C STAINLESS STEEL PANS for facing concrete blocks and insuring a smooth, fine-grained surface. Finest quality workmanship. Made to your specifications.

P&S MOISTURE CONTROL METER for semi-dry concrete mixes. Provides constant and uniform moisture content of every batch. Saves time—assures uniform height and texture of block—blocks are stronger with fewer culls.

B&C SLUMP BRICK MOLDS —made in 9 sizes and 9 thicknesses — any desired combination. For molding premium quality brick at low cost. In big demand for decorative work.

This newly-developed slump brick machine is capable of producing more than 1,000 units per hour, in a dozen sizes and colors.



BLOCK BUSTER splits either solid or cored blocks, up to 24" lengths. Quick adjustment for cutting various heights and widths. Blade will cut many blocks between sharpenings. No hydraulics and no air. Quiet, automatic, trouble-free operation —utmost safety.

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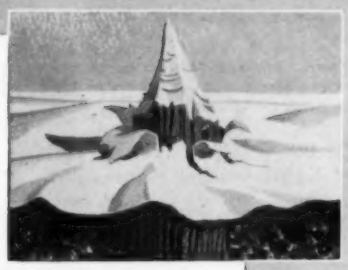
. . . are the BEST MOISTURE BARRIER!

● Medusa Moisture Barriers made with Medusa Waterproofings are water repellent, puncture-proof, tear-proof and non-porous. You simply can't break, rip, or tear them like you can moisture barriers of plastic films, building coatings and the like.

Medusa Waterproofed Cements are integral. Unlike a coating, or a sheet, or a film, they permeate through every square inch of the concrete mass . . . every single pore, making the concrete structure an impregnable fortress against water.

When you can have integral moisture barriers at the same cost as other methods, why take chances with films and coatings. Furthermore, you know Medusa Waterproofed Cements are successful because they have a proved 48-year record of stopping moisture. They are the finest protection possible for footings, foundations, basement floors, utility room and garage floors.

You can make your integral moisture barriers by either using Medusa Waterproofed Gray Portland Cement or Medusa Waterproofed White Portland Cement, or by mixing Medusa Waterproofing Paste or Powder with any regular portland cement.



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WHITE TILE GROUT CEMENT

MAKERS OF AMERICA'S FINEST PORTLAND CEMENTS FOR OVER SIXTY YEARS

Walt Keeler, president of the company, who contemplates further expansion of his concrete production facilities.

Walt Keeler of Wichita

prominent ready-mixed concrete producer extends basic plant pattern

another ON THE SPOT report

A colorful figure in the Kansas building industry for the last three decades and a former mayor of Wichita, Walter M. Keeler, president of Walt Keeler, Inc., has progressed in pace with the phenomenal growth of this section of the "Sunflower State". Born in Abilene, Kans., Mr. Keeler moved to Wichita at an early age. He started in business with his father, Levi Keeler, in 1926 in the concrete contracting field, establishing his own company in 1938. Since that time he has participated in one way or another in most of the construction concrete work which has been done in the Wichita region.

He started in the ready-mix business in 1941, and throughout the years of World War II he produced concrete for an impressive number of the large wartime industrial plants and for several thousand residences built around Wichita in connection with this expansion program.

In addition to the three ready-mixed concrete plants which the company now operates, it also has its own sand-producing plant and rock quarry close to Wichita; it produces crushed stone, agricultural limestone, and riprap from a plant in Florence, Kans.; and it maintains a large maintenance shop for the efficient upkeep of the 38 mixer trucks and other equipment the company uses. Over 100 persons are needed in the organization to produce the 1,000 to 2,000 cu. yd. daily, the present output of the three ready-mixed concrete plants.

In the basic plant pattern, the increment plant units are strategically located. The first of these—Plant No. 1, the original unit at the start of Mr. Keeler's operations—is located close to the center of Wichita. Plant No. 2—the plant herein described—is south of the city. Plant No. 3, in North Wichita, and No. 4, in process of construction in the western section of Wichita, have been placed in the paths of coming residential and industrial expansion. Future plans now in the drafting stage call for a fifth plant to be built east of the city.

The No. 2 plant contains many features of compact and efficient operation. Built entirely of reinforced concrete, it was designed by Mr. Keeler and erected by company forces. Slipforms were used for the construction of the exterior enclosing walls, which are 110 ft. high. The plant was erected between two parallel rail sidings of the Santa Fe Railroad. One track is equipped with an undertrack screw for handling bulk cement from bulk cars; the one on the other side, equipped with an under-track hopper, accommodates the delivery of aggregates from hopper-bottom cars.

Six overhead material bins having a total capacity of 600 to 700 tons of aggregates, and four overhead cement bins holding a total of 5,000 bbl. have been built integrally into the structure. The space under the lower slopes of these bins is used for the storage of 20,000 gal. of water. Overflow from the upper cement bins (capacity about 300 bbl.) falls by gravity into a larger bin below. Cement going to this lower bin is reclaimed by means of a bucket elevator, which raises it into the upper bins when and if needed.

On the batching floor level Howe Weightograph scales govern the proportioning of cement and aggregates. These scales have a capacity of 5 tons for cement and 25,000

The attractive general office building of Walt Keeler, Inc., Wichita, Kans., is one of the firm's best publicity features.

lb. for aggregates and are equipped with General Electric controls having Shrader air valves. On the mixer floor the 6-cu. yd. Smith tilting mixer below the batcher is capable of mixing 8 cu. yd. of concrete in one batch. Ready access between various levels in the plant is provided by a J. B. Ehrsam two-man elevator which operates inside a 100-ft. shaft in the center of the structure.

A 10-in. by 12-ft. Ehrsam screw conveyor moves cement from the undertrack hopper to the boot of the cement elevator. This Ehrsam chain-bucket type installation, powered by a U.S. 15-hp. synchronous motor, raises it up to the top of the cement bins, or acts to reclaim the cement from the lower storage bins. Sand and gravel are delivered by truck to four outside ground-level storage bins, separated by concrete walls. Aggregates are dumped into an underground hopper from which materials are fed onto a Barber-Greene inclined belt conveyor 24 in. wide by 160 ft. long. This conveyor takes materials up to the horizontal cross belt conveyor over the four-compartment storage bins, from which they are discharged into the proper bins.

Aggregates from these bins flow by gravity through eight hopper spouts onto a belt conveyor 100 ft. in length, located in the tunnel under the bins. Flow is governed by manually-operated gates through level controls. This belt conveyor discharges into the boot of an Ehrsam chain-bucket elevator, which takes the aggregates up to the six overhead storage bins. The elevator is operated by a Howell 45-hp. motor.

Sand comes from the company's own plant, located along Highway 42 southwest of Wichita. Here Mr. Keeler has built a dredge which takes sand from a 60-ft. depth by means of a pump. The dredge is equipped with an 8-in. by 75-ft. Eagle "Swintek" traveling screen chain dredging ladder and an 8-in. dredge pump. Primary power on the dredge is furnished by a Caterpillar model 17000 diesel engine.

Gravel is now purchased from the Concrete Materials Company, Moline, Kans., as Keeler's rock quarry output is no longer sufficient to supply the production requirements of the three plants. Portland cement comes from Monarch Cement Company, Humboldt, Kans., or from the Universal Atlas Cement Company, Independence, Kans., plant, all deliveries being made in bulk.

The sand-producing plant, with truck and rail loading units. The sand dredge may be seen in the left background.

The Walt Keeler ready-mixed concrete plant No. 1, located near center of Wichita.

The company's plant No. 3, showing crane and clamshell bucket loading of overhead bins.

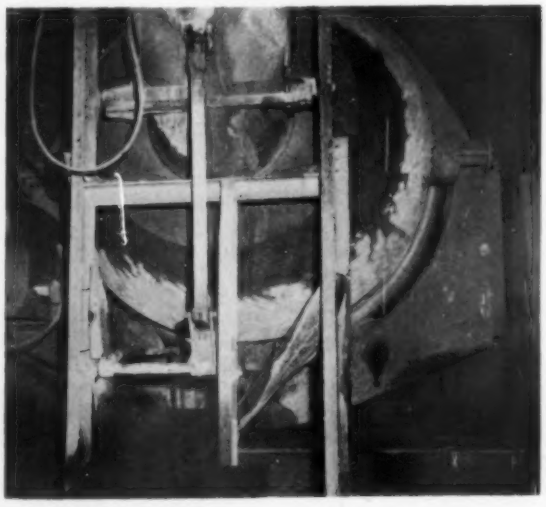
Above: A front view of two of the new half-cab chassis units, with Joe Vaught, general superintendent.

Left: Plant No. 2 was built using slip forms for the construction of the monolithic walls of the structure. The edge of the outdoor aggregate storage may be seen at the left.

This illustration shows the contrast between the new (left) and old (right) truck mixer mountings.

The new truck chassis, with front and rear tandem driven axles, has a capacity of 7½-cu. yd.

The tunnel under the aggregate storage area contains a belt conveyor and hopper spouts with manually controlled discharge gates.



The plant tilting mixer of 6-cu. yd. rated capacity in which 8-cu. yd. batches are premixed.

The sand dredge built by the Keeler Company, showing the 75-ft. traveling screen chain dredging ladder and the pump pipe line to shore.

Left: A two-man electric elevator moves personnel between various floor levels in the plant.

Equipment for the delivery of concrete includes 32 Smith 5½-cu. yd. rated capacity truck mixers, mounted on tandem rear axle Dart chassis. A dozen of these units have been converted by the Dart Truck Company to 7½-cu. yd. capacities by the installation of an additional power-driven front axle on these trucks and by remounting the mixer further forward on the chassis. This was made possible by installing the Dart half-cab directly over the front axle, with the engine ahead of this axle. All four axles of this chassis are power-driven. This permits the Dart model 15 DT chassis to carry 22,000 lb. on the two front axles and 34,000 lb. on the tandem drive rear axles, for a total G.V.W. of 56,000 lb. loading. With a short effective wheelbase of only 138 in., and a truck equipped with 10.00 x 22.00, 12-ply tires all around, these units are especially maneuverable for ready-mixed concrete deliveries which require a short turning radius at job sites. It is expected that more of the original truck chassis will be similarly converted to similarly mounted units in the future.

While a large percentage of the concrete produced by the Keeler company is made with natural aggregates, an increasing amount of lightweight aggregates is being required for roof and floor fill and for structural or insulating concrete requiring low unit weight. Aggregates for such concrete produced by Keeler include Buildex, Haydite, and Zonolite (vermiculite). When specified, Pozzolith as an admixture, and air-entraining concrete (Amberair, a product of National Sales Company) can be furnished. Keeler also uses and sells to other paving contractors a large amount of expansion joint material made by the W. R. Meadows Company, which is received in slabs 3 ft. by 5 ft. in size and reduced to the required usable widths and lengths on the company's cutting machine.

Among the equipment used in the company's plants are the following: 11 White 12-cu. yd. dump trailers, used for hauling sand to the ready-mixed concrete plants from the sand pits; a Koehring model 403 crane with 2-cu.yd. Erie clamshell, used at the main plant; a Northwest model 40D crane with a 3-cu. yd. clamshell; Northwest model 41 crane; a Northwest model 25 crane with a ½-cu. yd. clamshell, used at the new plant; 3 Hough Payloaders; a Caterpillar D-6 dozer; and 2 trucks used for wrecking and pickup purposes. Butane gas is used in all the above equipment except the cranes, which are diesel-powered. It is said that Mr. Keeler pioneered the use of butane gas in the Wichita area.

In addition to Mr. Keeler, other executives of the company include Wallace Sparks, general manager of plants; Joe Vaught, superintendent of the main plant and also equipment superintendent; George Ward, superintendent of the sand plant. Mrs. Irma M. Keeler, wife of Walt Keeler, is vice-president of the firm; Ralph Oliverson is secretary and assistant manager; Earl Henderson is sales manager; and Bill Walker is credit manager.

Accelerated Drying of Block Report Published by N.C.M.A.

The National Concrete Masonry Association has furnished all members with a copy of the technical report dealing with a kiln system of rapid drying of concrete masonry units. This series of tests, the report on which was prepared by Ed Mangotich, N. C. M. A. staff engineer, was made at the Baltimore, Md., plant of V. Paturzo Bro. and Son, Inc., during November, 1953. A specially designed dryer is being used there to dry concrete block though contact with combustion gases and heated air from an oil-fired furnace.

The purpose of the tests was to determine the effect of elevated temperature drying on the physical properties of the units. Results were obtained as to compressive strength, absorption, and other tests on block dried at 3, 7, and 14 days age at 300 deg. F., and includes other information on units dried at 270 and 240 deg. F., respectively, at 15 and 16 days age. Similar data for air-dried units has also been included in the report.

In general the results indicate high-temperature drying of block, as employed at the Paturzo plant, satisfactorily reduces the moisture content of block well below 30 percent of total absorption in a seven-hour drying cycle without significantly affecting the physical properties measured in the test.

At the first annual meeting of the Unit Masonry Association, Kansas City, Mo., held recently in that city, the officers of the previous year were unanimously re-elected. They are as follows: president, Frank T. Smith, Bricklayers Union No. 18, Kansas, A. F. of L.; vice-president, Weldon B. Royse, W. B. Royse Masonry and Waterproofing Co.; treasurer, R. E. Walker, The Carter-Waters Corp.; and secretary, L. S. Smith, Bricklayers Union No. 4, Mo., A. F. of L.

THE RESULT OF RESULTS

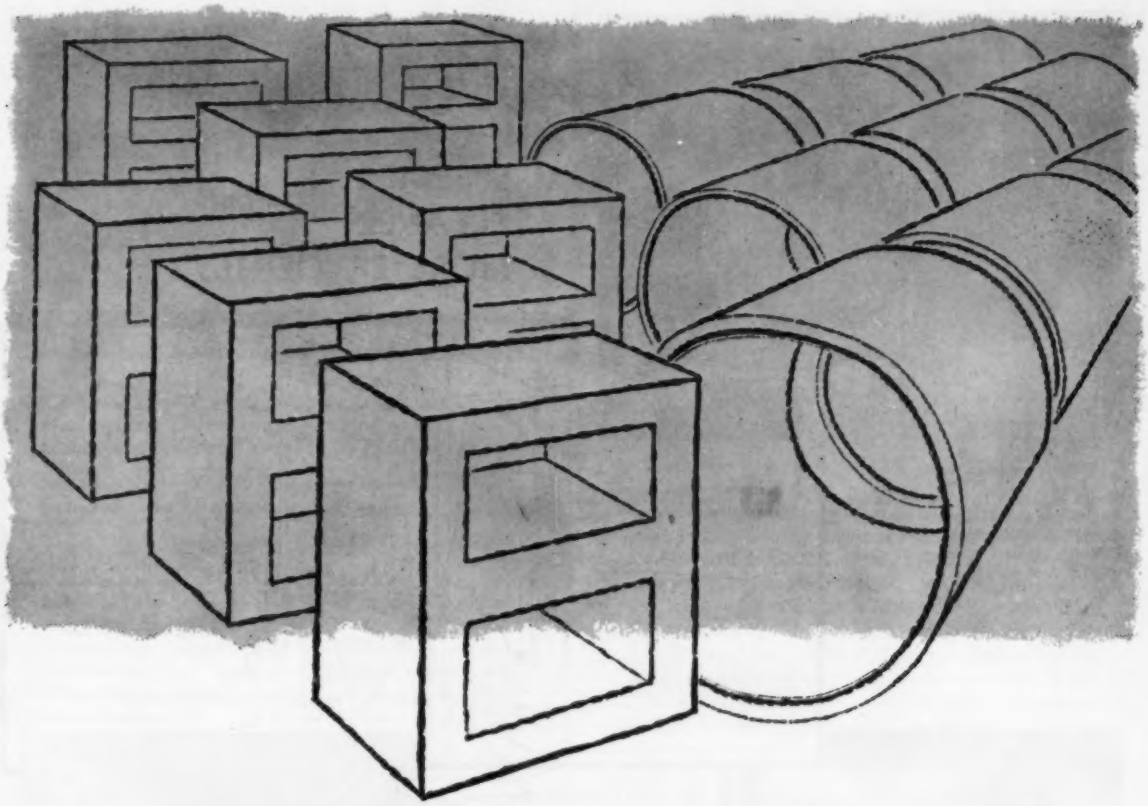
LEADING CONCRETE PIPE MAKER TRIED A HELTZEL PLANT, THE RESULT: THEIR NEXT RE-ORDER – ANOTHER HELTZEL

A couple of years ago a leading concrete pipe manufacturer purchased its first Heltzel plant for its southern operation in Florida. The manufacturer wanted a fast, accurate plant with large capacity that could be quickly converted to a transit mix plant to give greater flexibility of operation.

The Heltzel-designed plant lived up to specifications so well that, when executives of this concern decided upon additional batching equipment for their Ohio operation, they simply asked for a duplicate of the successful Florida setup. The new plant, above, is truly the *result of results* . . . If you want batching equipment that will stand up to specifications—follow the leaders to Heltzel Batchmasters.

THE HELTZEL STEEL FORM AND IRON COMPANY

49000 THOMAS ROAD • WARREN, OHIO



Increase output and quality

of concrete products with low-cost D-40

Let us show you how D-40 has helped other concrete products manufacturers make superior products, with a reduction in rejects, and at the same time increase production.

Economical D-40 plasticizes the "mix" to flow easier and more quickly into molds—filling out the corners and resulting in more perfect products. An added advantage is the reduction of abrasive wear on mixing and molding equipment.

Dry, granular detergent D-40 is easily added to the "mix" at the ratio of one to two oz. per bag of cement. Our experience is at your disposal. Contact any Oronite office for free sample of D-40 or ask for an Oronite detergent specialist to contact you.

ORONITE CHEMICAL COMPANY

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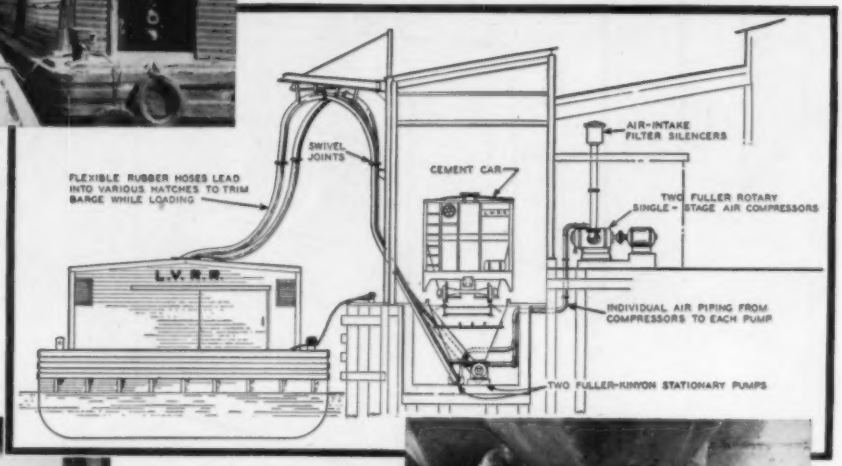
ORONITE CHEMICAL COMPANY

200 Bush St., San Francisco 20, Calif. • 714 W. Olympic Blvd., Los Angeles 15, Calif.
30 Rockefeller Plaza, New York 20, N. Y. • 20 North Wacker Drive, Chicago 6, Ill.
Mercantile Securities Building, Dallas 1, Texas • Carew Tower, Cincinnati 2, Ohio

Hoses entering hatches of barge. Cement car in shed "spotted" over Fuller-Kinyon Pumps in pit. Fuller-Kinyon Unloader in doorway, end of barge.

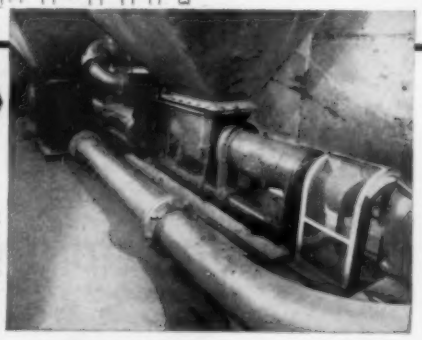
Air does it...

SPEEDIER
CLEANER
MORE EFFICIENTLY


FLEXIBLE RUBBER HOSES LEAD INTO VARIOUS HATCHES TO TRIM BARGE WHILE LOADING
SWIVEL JOINTS
CEMENT CAR
AIR-INTAKE FILTER SILENCERS
TWO FULLER ROTARY SINGLE-STAGE AIR COMPRESSORS
L.V.R.R.
INDIVIDUAL AIR PIPING FROM COMPRESSORS TO EACH PUMP
TWO FULLER-KINYON STATIONARY PUMPS

Two Fuller-Kinyon Stationary Pumps in pit. Pumps convey to barge at rate of 900-1000 bbl. an hour.

Unloader behind bulkhead in end of barge. At destination bulkhead is removed and unloader is propelled into barge, unloads cargo to storage on shore.



FULLER-KINYON SYSTEM unloads cars . . . conveys to barges . . . unloads barges for Lehigh Valley Railroad

In order to reduce the overall cost and speed up handling of bulk-cement shipments at its Jersey City terminal, Lehigh Valley Railroad engineers installed the Fuller-Kinyon Conveying System. Fuller-Kinyon Stationary Pumps convey from cars to barge, and Fuller-Kinyon Remote-Control Unloaders convey from barge to storage at various points in New York harbor . . . speedy, efficient, time-saving handling from the time cars arrive until final delivery to the consumer.

The pumps for unloading from cars to barge, convey through two conveying lines at rate of 900 to 1000 barrels an hour. The unloader has a rated capacity of 150 barrels an hour. One man operates and controls this machine by means of a flexible electrical cable and hand-control switch . . . start and stop, to right or left, forward or backward, wherever cement is to be picked up in the barge.

Air for the Fuller-Kinyon Stationary Pumps is supplied by two Fuller Rotary Compressors, each having a capacity of 614 c.f.m., at 12-lb. pressure. These compressors are installed on the pier adjacent to the car-unloading station.

If you are interested in efficient handling of bulk cement, write for Bulletins FK-20C and FK-27, illustrating and describing cement handling with Fuller equipment.

P-155
1389

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—
COMPRESSORS AND VACUUM PUMPS—
FEEDERS AND ASSOCIATED EQUIPMENT

FULLER COMPANY, Catasauqua, Pa.
GENERAL AMERICAN TRANSPORTATION CORPORATION SUBSIDIARY
Chicago • San Francisco • Los Angeles • Seattle • Birmingham

Haul extra yards each trip
Save time with more maneuverable short wheelbase trucks

USE BLAW-KNOX *Hi-Boy* TRUKMIXERS

How would you like to haul a load or two more a day... and carry maximum legal pay load each trip?

You can do it easily with Hi-Boy Trukmixers!

Hi-Boy 4½, 5½ and 6½ cu. yd. Trukmixers are designed to solve three profit-stealing problems... weight, length and axle load. Combining the flush water tank and pedestal, reduces total weight of the unit by about half-a-ton and substantially lowers the center of gravity of the mixer. Locating the engine to the left rear permits moving the mixer forward 20" and shifts the load center of gravity closer to the front axle so it can carry more of the legal weight allowance. These design improvements let you use highly maneuverable short wheel base trucks that get you through traffic, into the job site, up to the forms and back to the plant *fast*. In the time saved you can often haul an extra load or two a day!

MORE *Hi-Boy* DESIGN IMPROVEMENTS

Large Diameter Short Drum mixes even zero slump concrete fast and thoroughly. Concentrates batch at front end for better over-all weight distribution.

Big Inner Cone for Fast Charging . . . 8-9 seconds per yard . . . and eliminates spilling of materials.

Better Blade Design, with flange on the discharge side, prevents segregation during discharge.

Low Maintenance results from the accessibility of the side-mounted transmission and engine, which permits easy inspection of vital parts. Engine and radiator enclosed against all weather conditions. Inexpensive, easily cleaned air filter protects the radiator.

Be sure to investigate the many more profitable, practical Hi-Boy features before you decide on any truck mixer . . . and ask your Blaw-Knox distributor to explain the advantages of the Blaw-Knox "Complete Ready-Mix Package."

BLAW-KNOX COMPANY
CONSTRUCTION EQUIPMENT DIVISION

Pittsburgh 38, Pa.
Offices in Principal Cities

ETYMOLOGICALLY SPEAKING

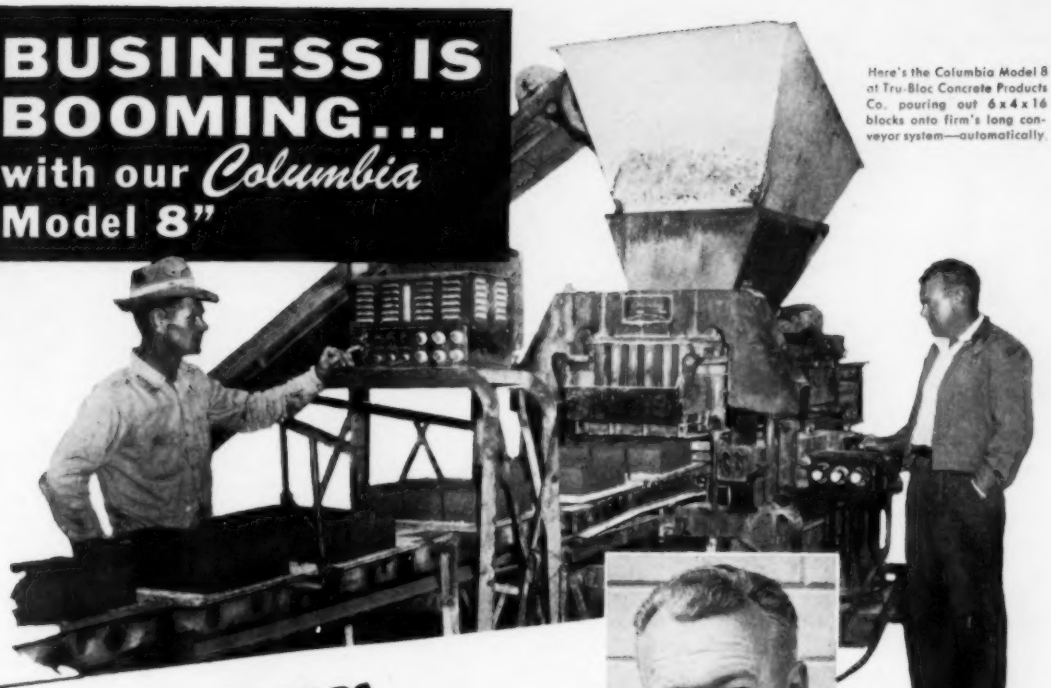
Will It Ever End?

SINCE the first edition of Webster's dictionary of the English language, published in 1828, each edition of this authoritative tome has grown in size, to include new words, new connotations, *ad infinitum*. It is now our humble opinion that the previously-publicized listings of trade names of substances, products, processes, and other materia, allegedly derived from the basic word "concrete", may extend similarly into the future, restrained in scope only by protective patent laws and/or a sheer inertia of mental ingenuity.

In reprinting the following lists of some 213 additional names, published in the June, 1954, and April, 1955, issues of the *Journal* of the American Concrete Institute, we feel that it may well be our last chore in aiding and abetting this stupendous etymological effort, so admirably compiled by *Journal* readers over the past years. (See ACI *Journal*, Nov. 1950, *Proc.* V. 47. p. 263; May, 1951, *Proc.* V. 47, p. 752; Mar. 1953, *Proc.* V. 49, pp. 682-684; PIT AND QUARRY, Sept. 1953, pp. 226-228.)

Word	Where used
Aerocrete	(Lightweight aggregate) Aerocrete Construction Co. Ltd., Montreal, Que., Canada; *The Engineering Journal*, Apr. 1953, p. 118 (Note: this is the third separate noted use of this name)
Air-o-crete	(Air-o-crete masonry units), Concrete Products Co., Petersburg, Va.
Aquacrete	(Portland cement), *Concrete and Constructional Engineering*, Mar. 1954, p. 118
Arrowcrete	Arrowcrete Corp., Columbus, Ohio; *Rock Products*, Nov. 1953, p. 59
Biscrete	PIT AND QUARRY, Sept. 1953, p. 233
Blastcrete	Blastcrete Equipment Co. Inc.; *Roads and Streets*, May 1953, "What's New," No. 5
Bondcrete	(Plaster) U. S. Gypsum Co., Sweet's File
Calk-Crete	(Calking compound) Servicised Products Co.; Chicago, Ill.; *Contractors and Engineers*, Apr. 1954, p. 116
Calsi-Crete	Calsi-Crete Corp., Saginaw, Mich.; *Rock Products*, June 1953, p. 222
Ceilcrete	Ceilcote Co., Cleveland, Ohio; *Concrete*, Feb. 1953, p. 39
Channelcrete	(Roof slabs used on high school at Greensboro, N. C.) *The Engineering Journal*, Mar. 1954, p. 273
Chucklecrete	PIT AND QUARRY, Oct. 1953, p. 178
Cincon	Cincon Block & Pipe Co., Baltimore, Md. (classified telephone directory)
Cincrete	The Cincrete Corp., Long Island City, N. Y.; *Concrete*, Mar. 1953, p. 8
Cindercrete	Cindercrete Products Co., Regina, Sask., Canada; PIT AND QUARRY, Jan. 1954, p. 286
Colorcrete	(Portland cement) *Concrete and Constructional Engineering*, Mar. 1954, p. 118
Concretemen	Headline, Houston, Texas, *Chronicle*, Oct. 28, 1953
Concretera	Compania Anonima la Concretera, Caracas, Venezuela; PIT AND QUARRY, Aug. 1953, p. 149
Concretex	Elliot's Concretex; *Clarion-Ledger*, Jackson, Miss., Apr. 12, 1953
Concretor	(Hydraulic jack) B. M. Heede, Inc., New York, N. Y.; *Engineering News-Record*, Oct. 8, 1953, p.343
Concut	(Saws) Concrete Sawing Equipment, Inc., Arcadia, Calif.; *Contractors and Engineers*, Jan. 1954, p. 124
Con Saw	Clipper Manufacturing Co., Kansas City, Mo.; *Concrete*, Apr. 1953, p. 50
Con Saw-matic	Clipper Manufacturing Co., Kansas City, Mo.; *Engineering News-Record*, Apr. 1, 1954, p. 90
Corcrete	(Misprint for "curcrete" *q.v.*) *Contractors and Engineers*, Apr. 1954, p. 12
Cover Crete	(Finish plaster) National Gypsum Co., Buffalo, N. Y., Sweet's File
Crecel	(Road jointing) Ruberoid Co., Ltd., London, England; *Concrete and Constructional Engineering*, Mar. 1954, p. xxii
Creco	Creco, Long Island City, N. Y.
Crescrete	Jahncke Service Corp., New Orleans, La.
Cretoids	(Grinding media) Helipebs Ltd., Gloucester, England; *Cement and Lime Manufacturer*, Jan. 1954, p. iii
Curcrete	(Curing compound) *Contractors and Engineers*, Apr. 1954, p. 14
Demicon	Demarest Engineering Co., Newark, N. J.; *Engineering News-Record*, July 2, 1953, p. 88
Drycrete	Shield Chemical Corp., Verona, N. J.; *Civil Engineering*, June 1953 p. 114
Emeri-Crete	Walter Maguire Co., Inc., New York, N. Y.; *Rock Products*, July 1953, p. 34
Feathercrete	Aerocrete Construction Co., Ltd., Montreal, Que., Canada; *The Engineering Journal*, Apr. 1953, p. 118
Ferro-Concrete	Girlings Ferro-Concrete Co., Ltd., *Civil Engineering and Public Works Review*, Mar. 1953, p. 260
Ferrocrete	(Brand of portland cement) The Cement Marketing Co., Ltd., London, England; *Concrete and Constructional Engineering*, Mar. 1954, p. lxvii; British Columbia Cement Co., Ltd., Bamberton, B. C., Canada; PIT AND QUARRY, Map 1952
Gritcrete	(Lightweight concrete product of the Aerocrete Co.); *Civil Engineering*, Sept. 1953, pp. 47-48
Gun-Crete	Gun-Crete Cement, Salem, Ore.; *Rock Products*, Mar. 1953, p. 139
Helicon	(High strength welded mesh reinforcement) Helical Bar and Engineering Co., Ltd., London, England, *Concrete and Constructional Engineering*, Mar. 1954, p. lvi
Insta-crete	(Sealer and hardener) LSU Report on Prevention of Concrete Pipe Corrosion, 1954
Kalicrete	Kalicrete Portland Cement, Fort Whyte, Ont., Canada; *Engineering News-Record*, May 7, 1953, p. 24
Ken-Crete	Ken-Crete Products Co., Inc., Truesdell, Wis.; *Rock Products*, Nov. 1953, p. 135
Konseal	(Curing compound) The Sullivan Co., Memphis, Tenn.

"BUSINESS IS BOOMING... with our *Columbia* Model 8"



Here's the Columbia Model 8 at Tru-Bloc Concrete Products Co. pouring out 6 x 4 x 16 blocks onto firm's long conveyor system—automatically.

HAROLD LOGAN
co-owner of Tru-Bloc Concrete Products

TRU-BLOC
CONCRETE PRODUCTS

CONCRETE BLOCKS · CEMENT · LIME — SAND · GRAVEL · REINFORCING ST

Plant: Texas Street and Friars Road, Mission Valley

2336 Madison Avenue, San Diego 16, California

Mr. Walter Neth
Sales Manager
Columbia Machine
107 S. Grand Ave.
Vancouver, Wash.

Dear Walt:

You'll be glad to know that our business has really been booming since we installed our latest Model 8 Columbia machine.

Not only are we doing more business with the larger builders and contractors, but we are also making more and more sales direct to home-owners and small builders, furnishing many types of block for patios, planters, walls, fences, etc.

This type of production is no great problem with our Columbia, with its quick mold change, easily replaced wearing surfaces, and high-speed operation made possible by its short head movement--plus the fact that it's fully automatic, requiring minimum attention from the operator.

And this is very important--we get excellent service on parts, meaning that we never lose vital production time while we're waiting for a replacement part!

Sincerely yours,

Harold E. Logan

HAROLD E. LOGAN

SAN DIEGANS LIKE THE QUALITY & VARIETY OF *Columbia* -MADE BLOCK

Word-of-mouth advertising by satisfied customers is hard to beat as a means of building business . . . and that's what is helping Tru-Bloc Concrete Products Company of San Diego, California, to expand its sales from month to month. To keep up with demand for its wide variety of concrete products, Tru-Bloc relies on the rugged, trouble-free, high-production Columbia Model 8!

FOR COMPLETE INFORMATION ON THE COLUMBIA LINE, WRITE TODAY TO:

***District Offices in:* Wisconsin, Ohio, South Carolina, Mississippi, Florida, New Jersey, Virginia, California, and Massachusetts.**

Columbia MACHINE

Home Office: 107 S. GRAND, VANCOUVER, WASHINGTON

Factory Branch and Warehouse at Mukwanago, Wisconsin

Metallicrete	Metallicrete Floor Co., Ltd., Westmont, Canada; ACI *Journal*, Jan. 1954, *News Letter*, p. 21
Modern-Crete	(Vermiculite wall panels) *Rock Products*, Mar. 1954, p. 65
Monocrete	(Brand of portland cement) British Columbia Cement Co., Ltd., Bamberton, B. C., Canada; PIT AND QUARRY, Map 1952
Novacrete	(Masonry paint) Homasote Co., Trenton, N. J.; *Architectural Record*, Nov. 1953, p. 351
Nyce Crete	Nyce Crete Co., Lansdale, Pa.; PIT AND QUARRY, Sept. 1953, p. 250
One-Concrete	One-Concrete Inc., Wichita, Kan.; *Rock Products*, Feb. 1954, p. 148
Pak-Crete	(Block machine) Pak-Crete sales, Chicago, Ill.; *Rock Products*, Jan. 1954, p. 234
Precon	The Precon Co., Aurora, Colo.; ACI JOURNAL, June 1953, *News Letter*, p. 31
Rubbercrete	(Rubber-base concrete floor paint) Jackson, Miss., *Daily News*, Apr. 16, 1954
Ryancrete	Ryan Builders Supplies Ltd., Windor, Ont., Canada; *Concrete*, Oct. 1953, p. 32
Scoot-Crete	Getman Bros., South Haven, Mich.; *Engineering News-Record*, May 14, 1953, p. 118
Snowcrete	(White portland cement) Cement Marketing Co., Ltd., London, England; *Concrete and Constructional Engineering*, May 1953, p. 1 (Note: "Snowcrete" as used in *Military Engineer*, May-June 1950, V. 42, pp. 176-178, refers to "the condition of snow resulting from compaction by natural or mechanical means.")
Spracrete	Spracrete Process, Richmond, Va.
Sta-Crete	(Waterproofing) Pioneer Latex and Chemical Co.; Hartford, Conn., *Courant*, Apr. 18, 1954, Part III, p. 8
Steelconcrete	Steelconcrete Design and Construction Co., London, England; *Concrete and Constructional Engineering*, Feb. 1954, p. xliv
Stelcon	(Stelcon anchor slabs) *Rock Products*, Dec. 1953, p. 182
Stresscon	(Post-tensioning system) *The Engineering Journal*, Oct. 1953, p. 1281
Stripcrete	PIT AND QUARRY, Sept. 1953, p. 88
Tecon	Tecon Corp., Dallas, Texas; *Rock Products*, Dec. 1953, p. 148
Texcon	Texas Concrete Products Co., Dallas, Texas
Thermocrete	Thermocrete Plant, Fredericton, N. B., Canada; PIT AND QUARRY, Jan. 1954, p. 237
Vibracrete	Concrete Building Units Co., Kansas City, Mo.; PIT AND QUARRY, June 1953, p. 167
Vibrocon	(Vibrating spade) Winget Ltd., Rochester, Kent, England; *Concrete and Constructional Engineering*, July 1953, p. lviii
Weld-Crete	Larsen Products Co., Bethesda, Md.; PIT AND QUARRY, May 1953, p. 346
Z-Crete	Zonolite Co., Evanston, Ill.; *Chemical Engineering*, Sept. 1953, p. 176

In addition to these new listings, additional information is available on a number previously listed,* as follows:

Name	New Data
Colcrete	Also Murray Colgrout Piling Inc., Iondon, England; *Concrete and Constructional Engineering*, Aug. 1953, p. xvii
Concore	Change "Howard Co." to "Frank L. Howard Engineering Co."
Crete-O-Lux	Change "Heywards Ltd." to "Haywards Ltd., London"
Cretex	(Concrete pipe) South Dakota Concrete Products Co., Watertown, S. D.; *Engineering News-Record*, Oct. 8, 1953, p. 265
Dumpcrete	Maxon Construction Co., Dayton, Ohio
Eternacrete	Change "Co." to "Inc."
Ferrocrete	(Brand of portland cement) The Cement Marketing Co., London, England
Hydrocreter	Add: Melrose Park, Ill.
Koncrete	Change to "Konkrete"
Krete-Koter	Change to "Krete-Koater," and add: Krete-Koater Service Co., Hillsboro, Ill.; PIT AND QUARRY, Aug. 1953, p. 177
Marblecrete	Harter Marblecrete Stone Co., Oklahoma City, Okla.
Mearlcrete	Change data to: Mearl Mfg. Co., New York, N. Y.; *Engineering News-Record*, Apr. 30, 1953, p. 98
Mercrete	Add: *Rock Products*, Sept. 1953, p. 150
Penncrete	Change to "Penn-Crete" and add: PIT AND QUARRY, July 1953, p. 249
Permacrete	Add: Columbus, Ohio; *Rock Products*, Sept. 1953, p. 151
Plastocrete	Add: PIT AND QUARRY, Feb. 1953, p. 131
Porete	Add: N., Arlington N. J.
Pumpcret	Add: *Concrete and Constructional Engineering*, Aug. 1953, p. xxii
Pumpcrete	Add: *Engineering News-Record*, Mar. 26, 1953, p. 54
Resto-Crete	Add: Western Waterproofing co., . . . *Civil Engineering*, Apr. 1953, p. 125
Screwcrete	Add: Screwcrete piles, Braithwaite & Co., Ltd., London; *Civil Engineering and Public Works Review*, Dec. 1953, p. 1097
Sealocrete	Add: London
Sparkle-Crete	Add: PIT AND QUARRY, Oct. 1953, p. 161 8fl, Oct. 1953, p. 161
Spun-Crete	Add: (lighting standards) . . . Chicago; *American City*, Nov. 1953, p. 1134
Strata-Crete	Add: Los Angeles, Calif.
Strestcrete	Add: PIT AND QUARRY, Mar. 1953, p. 207
Telecrete	Add: Telehoist Ltd., Cheltenham, Glos., England
Texcrete	Add: Dallas, Texas, *Rock Products*, Apr. 1953, p. 86; Corpus Christi, Texas, *Rock Products*, Mar. 1953, p. 62; Shreveport, La., PIT AND QUARRY, Nov. 1953, p. 192
Transcrete	Add: Waterloo, Iowa

Seemingly, we have the answer to our question posed at the start of this article, in an additional list of over 120 new names, which came to us recently from three compilers. It would indicate that this name-compounding practice *will never end*. We give you these final additions to those published in the past, bringing the total to something over 330 names:

Arld Crete	Arld Crete Co., Cincinnati, Ohio
Auto-Crete	(Concrete mixer) Allison Steele Co., Phoenix, Ariz.; *Better Roads*, Apr. 1954, p. 59
Cellucrete	Willson, patented 1943
Crete Seal	(Curing compound) Calbar Paint and Varnish Co., Philadelphia, Pa.
Evercrete	(Waterproofing) Evercrete, Inc., New York, N. Y.; *Thomas' Register*
Fibercrete	McMillan, U. S. Patent 1907080; Kelley Island Lime and Transport Co., Cleveland, Ohio
Hamcrete	PIT AND QUARRY, May 1954, p. 156

*"Concrete's Etymological Offspring (LR 49-16)," ACI JOURNAL, Mar. 1953, *Proc.* V. 49, p. 682.

SMITH
THE T. L. SMITH CO. MILWAUKEE, U.S.A.

It's Simple Arithmatic:

SMITH MIXING
+ MATERIAL CONTROL
+ WATER CONTROL
= QUALITY CONCRETE

The pitcher with control wins ball games.

The Smith-equipped plant controls the mix . . . produces QUALITY CONCRETE . . . wins satisfied customers. When you see Smith mixers at a plant, whether the operator premixes in a Smith Tilter or transit mixes in Smith Truck Mixers, you know that he insists on complete control — that he delivers quality concrete.

And remember, with seven sizes of Tilters and over twenty types and sizes of truck mixers, there is a Smith tailor-made to meet your individual requirements. Write for literature.

THE T. L. SMITH COMPANY, 2887 N. 32nd St., Milwaukee 10, Wis.

Affiliated with Essick Manufacturing Company, Los Angeles, Calif.

BUILDERS OF BETTER MIXERS FOR MORE THAN 55 YEARS

Hydrecon Koncrete	(Refractory concrete) Koncrete Krushers, PIT AND QUARRY, Aug. 1954, p. 46
Metalcrete	Metalcrete Co., Cleveland, Ohio
Modern Crete	Modern Crete Production Co., Kenova, W. Va.; *Rock Products*, Aug. 1954, p. 212
National-Crete	(Cellular concrete) National Foam System, Inc., West Chester, Pa.; ACI *Journal*, May 1954, p. 10
Pipecrete	Pipecrete Inc. (Manufacturers of concrete pipe)
Precrete	(Prestressed concrete manufacturer) Precrete, Inc., New York, N. Y.; *Engineering News-Record*, July 22, 1954, p. 64
Strescrete	(Prestressed roofing block) Atlas Building Products Co., El Paso, Texas; *Contractors and Engineers*, June 1954, p. 32
Tufcrete	(Waterproofing) Tufcrete Co., Inc., Des Moines, Iowa; *Thomas' Register*
Artcrete	(Concrete benches and other products) Artcrete Products Co., Havertown, Pa.; *House and Garden*, May 1954, p. 59
Blokcrete	The Blokcrete Co., Ltd., Southampton, England; ACI *Journal*, May 1954, p. 796 (item 67)
Concreteclad	MacQueen Service; *Building Supply News*, Feb. 1954, p. 732
Crete Color	Wilbur & Williams Co., Brighton, Mass.; *Building Supply News*, Feb. 1954, p. 733
Duro-Crete	Duro-Crete Co., East Providence, R. I.; Providence telephone directory
Elasticrete	(Cellular lightweight concrete) Elastizell Corp. of America, Alpena, Mich.; PIT AND QUARRY, Oct. 1954, p. 182
Geocon	Geocon, Ltd. (formerly Gunite & Waterproofing Ltd.) Halifax-Montreal-Toronto-Dorval (Canada); *Engineering News-Record*, Oct. 28, 1954, p. 66
Grancrete	Grancrete Co., Inc., Boston, Mass.; Providence telephone directory
Greencon	(Saw for green concrete) Clipper Mfg. Co., Kansas City, Mo.; *Engineering News-Record*, July 22, 1954, p. 5
Hilcon	(Floor and wall slabs) Hills (West Bromwich), Ltd., England; *Concrete and Constructional Engineering*, June 1954, p. xix
Hyprescon	(Steel-cylinder-reinforced concrete pipe) Pressure Pipe Co. of Canada, Ltd., Montreal, Canada; *Engineering Journal*, Jan. 1955, p. 20
Jetcreter	(Concrete placing gun) Construction Machinery Sales Co., Waterloo, Iowa; *Contractors and Engineers*, Sept. 1954, p. 80
Konkreto	(Rubberized floor enamel) Murphy Paint Co.; *Hartford Times*, Sept. 16, 1954, p. 6
Laticrete	(For repairing concrete floors, lining tanks, bedding tiles, etc.) Dominion Rubber Co., Ltd., Montreal; *Engineering Journal*, Oct. 1954, p. 1364
Nomocrete	(Slide-rule attachment for proportioning simple R/C beams) Gesellschaft der Ludwig von Roll'schen Eisenwerke AG, Gerlafingen; *Schweizerische Bauzeitung*, July 31, 1954, p. 455
Pumpkret	(Concrete pump) Beton-Spritz-Maschinen GmbH., Frankfurt am Main, Germany
Qualicrete	PIT AND QUARRY, Oct. 1954, p. 120
Split-Crete	(Masonry units) Park Ave. Cement Block Co., Cranston, R. I.; Providence telephone directory
Stone-Crete	(Block and brick) Park Ave. Cement Block Co., Cranston, R. I.; Providence telephone directory
	(Concrete and masonry paint) Tamms Industries, Inc., Chicago, Ill.
Strescon	(Prefabricated prestressing units) Prestressed Concrete Corp., Kansas City, Mo., and Torrance, Calif.
Torkret	(Grout injection machine) Torkret GmbH, Berlin, Germany; *Bauingenieur*, Aug. 1954, adv. p. 3
Blazecrete	(Castable refractory) Johns-Manville Sales Co., New York, N. Y.
Car-Na-Crete	(Concrete floor surfacer) Continental Car-Na-Var Corp., Brazil, Ind.
Conco	(Concrete floor paint) Aquabar Co., Philadelphia, Pa.
'Crete-Clean	(Cleaner for masonry surfaces) Wilbur & Williams Co., Brighton, Mass. (Tradename section of handbook)
'Crete-Cleen	(See 'Crete-clean) Wilbur & Williams Co., Brighton, Mass. (Classification and directory sections)
Durocon	(Integral hardener for concrete floors) Aquabar Co.; Philadelphia, Pa.
Dye-Crete	(Rubber-base paint for concrete floors) Wilbur & Williams Co., Brighton, Mass.
Ferricon	(Concrete floor hardener) Truscon Laboratories, Detroit, Mich.
Ferrocon	(Waterproofing agent) Aquabar Co., Philadelphia, Pa.
Firecrete	(Castable refractory) Johns-Manville Sales Corp., New York, N. Y.
Garcrete	(Plasticizer) Garco Products, Inc., Butler, Pa.
Hearth-Crete	(Castable refractory) Quigley Co., New York, N. Y.
Hil-Crete	(Rubberized floor enamel) Hillyard Chemical Co., St. Joseph, Mo.
Insulcrete	(Castable refractory) Quigley Co., New York, N. Y.
Kleencrete	(Masonry surface cleaner) Evercrete Corp., New York, N. Y.
Konkerit	(Masonry paint) Toch Brothers, Inc., Staten Island, N. Y.
Konset	(Admixture) Sullivan Co., Memphis, Tenn.
Kontite	(Masonry paint) Sullivan Co., Memphis, Tenn.
Korkrete	(Primer to be used prior to applying corkboard insulation) Lewis Asphalt Engineering Corp., New York, N. Y.
Kretedye	(Floor hardener and coloring agent) Aquabar Co., Philadelphia, Pa.
Masticrete	(Patching/resurfacing material) Glidden Co., Cleveland, Ohio
Nu-Krete	(Floor surfacing) Warren Refining & Chemical Co., Cleveland, Ohio
Plastikon	(Adhesive) B. F. Goodrich Co., Cleveland, Ohio
Refract-O-Crete	(Refractory brick) Acme Brick Co., Fort Worth, Texas
Sealcrete	(Coating) Service Industries, Philadelphia, Pa.
Selbacrete	(Surfacing and repair material) Selby Battersby & Co., Philadelphia, Pa.
Synkrete	(Cleaner for concrete floors) Synthex Products Co., New York, N. Y.
Tempacrete	(Concrete floor hardener) Fort Pitt Chemical Co., Pittsburgh, Pa.
Tremcrete	(Silicate aggregate for use with mastic flooring materials) Tremco Mfg. Co., Cleveland, Ohio

Prescription

Rx

for aggregate production

HUBER-WARCO
CINDER GRINDERS

The Huber-Warco No. 9 Grinder has been designed to give big-volume aggregate production, with a substantial savings to the user.

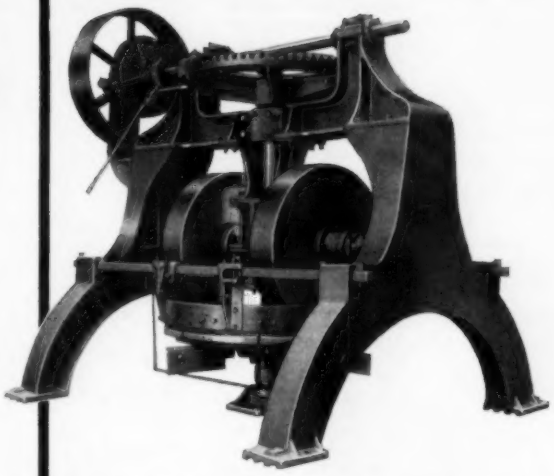
Capacity of this grinder is 30 yards per hour, handling such material as cinders, pumice, haydite, slag and quarry and mine products, with a low power consumption.

The suspended yoke mounted mullers are adjustable to any height, and for finer grinding, the grinding surfaces run together.

The No. 9 Grinder will give years of trouble-free service, with a minimum of maintenance.

Huber-Warco Grinders range in capacity from 4 to 75 yards per hour. Whatever your capacity requirements, there's a Huber-Warco Grinder suited to your type of aggregate.

For a profitable, non-obligating consultation with the Huber-Warco grinding specialist . . . write, wire or phone.



SPECIFICATIONS

(CONDENSED)

- **Capacity — 30 yards per hour**
- **Horsepower required — 25 H. P.**
- **Speed of 48" clutch pulley — 150 R. P. M.**
- **Floor space — 12'8" x 11'2"**
- **Overall height — 10'11"**
- **Weight — 31,000 pounds**

HUBER W WARCO

HUBER-WARCO COMPANY

MARION, OHIO, U. S. A.

Road Machinery

CABLE ADDRESS: HUBARCO

ROAD ROLLERS • MOTOR GRADERS • MAINTAINERS • GRINDERS

Zilicon	(Integral waterproofer for mass concrete) Truscon Laboratories, Detroit, Mich.
Aerocrete	Also (Admixture; lightweight concrete made therewith) Aerocrete Corp. of America, Rochelle Park, N. J.
Crescrete	Also (Hardener-accelerator-densifier admixture) Ceressit Waterproofing Corp., Chicago, Ill.
Demicon	Also (Concrete curing and hardening) McMillan Products Co., Hazel Park, Mich.; *Engineering News-Record*, Oct. 7, 1954, p. 380
Duracrete	Also (Pozzolanic plasticizer) Aquabar Co., Philadelphia, Pa.
Nailcrete	Add (Fireproof compound mixed with cement and water; uses: nailing base, plaster, roof coating, and floor slabs) Nailable Concrete Co., New York, N. Y.
Aircreter	(Nonagitating ready-mix truck) Supermix, Inc., Adrian, Mich.
Arid-Crete	Arid-Crete Corp. of Cincinnati, Cincinnati, Ohio
Art-Crete	(Concrete masonry) Art Craft Blocks, Inc., Canton, Ohio. First use 1948
Baffle Crete	(Castable refractory) Mexico Refractories Co., Mexico, Mo. First use 1936
Basicrete	(Hydraulic-setting, chrome base, castable cement) General Refractories Co., Philadelphia, Pa. First use 1949
Camperete	(Self-setting surfacing and resurfacing materials—namely, cement and asphaltic compositions) The Camp Co., Chicago, Ill. First use 1948
Can-Crete	(Canned colored cement) The Sullivan Co., Memphis, Tenn.
Cast-Crete	(Precast concrete products) Cast-Crete Products Co., San Angelo, Texas. First use 1933
Channel Crete	(Prefabricated roof slabs) The Formigli Corp., Berlin, N. J. First use 1937
Creto	Creto Co. of California, Los Angeles, Calif.
Dense-Crete	(Accelerator) Rock-Tred Corp., Chicago, Ill. First use 1939
Durocrete	(Ready-mixed heavy duty floor repair cement) American Fluresit Co., Cincinnati, Ohio
Evercrete	(Treatment for dustproofing and preventing lime action on oil base paints) Evercrete, Inc., New York, N. Y.
Fabcrete	(Prefabricated floor, wall, or roof units) Fabcrete Corp., Richmond, Va. First use 1947
Factocrete	Broadway Trust Co., Westminster, England
Flex-Or-Crete	Flex-Or-Crete Corp., Boston, Mass.
Furnas Crete	(Castable refractory) Mexico Refractories Co., Mexico, Mo. First use 1932
Glazcrete	(Glazed facing material of cement and aggregate) Horace A. Reeves, Ardmore, Pa. First use 1948
Guncrete	(Pneumatically applied concrete) Cement Gun Co., Allentown, Pa. First use 1914
Handicrete	(Concrete gravel mix) The Carney Co., Inc., Mankato, Minn. First use 1950
Heat-Crete	(Admixture) Products Planning Co., Pittsburgh, Pa.
Hoffcrete	(Waterproofing adhesive masonry mortar) George W. Hoffmann Corp., New York, N. Y. First use 1947
Kaycrete	(Expanded perlite aggregate for admixture with refractory cement) Great Lakes Carbon Corp., New York, N. Y. First use 1951
Kon Creto	Murphy Varnish Co., Ltd., Montreal, Canada
Koncrex	A. C. Horn Co., Long Island City, N. Y.
Konkrete Kore	(Concrete drill) Tilden Tool Mfg. Co., Pasadena, Calif.
Konkure	(Curing compound) J. R. Anderson Co., Los Angeles, Calif.
Latex-O-Crete	(Floor resurfacing compound) United Laboratories, Inc., Cleveland, Ohio
Lubricon	B. A. Davenport, Inc., Washington, D. C.
Masticon	Frank White, Minneapolis, Minn.
Novocrete	The Novocrete Co., New York, N. Y.
Omacrete	(Premixed concrete) Concrete Products and Material Co., Inc., Omaha, Neb. First use 1947
Prestcrete	(Prefabricated concrete units) Illinois Prestcrete Co., Plano, Ill.
Presscrete	(Grouting equipment) The Presscrete Co., Inc., New York, N. Y.
Pumacrete	(Cementitious building materials) The Ketell Co., Los Angeles, Calif. First use 1946
Red E Crete	(Premixed concrete) Kuring and Erickson, Assoc., Glendale, Calif. First use 1946
Rockercrete	(Block machine) Roy Darden Industries, Inc., Atlanta, Ga.
Rocrete	(Material used in precast building units) The Rohan Co., Inc., Garden City, N. Y. First use 1933
Sackcrete	Sackcrete, Inc., Cincinnati, Ohio
Steel-Crete	(Concrete and plastic compositions) Joseph Downes, Sioux City, Iowa. First use 1921
Steelcrete	(Expanded metal and reinforcing mesh) Wheeling, W. Va. First use 1907
Thermo-Con	Higgins Industries, New Orleans, La.
Trip-L-Crete	(Patching cement) Trip-L-Seal, Inc., Washington, D. C. First use 1947
Tufcrete	Tufcrete Co., Des Moines, Iowa. First use 1940
Unicon	(Vermiculite concrete) Universal Insulation Co., Chicago, Ill.
Vitocrete	The Portland Cement Selling and Distributing Co., Ltd., London, England

Moisture-Humidity Relations Cited in N.C.M.A. Bulletin

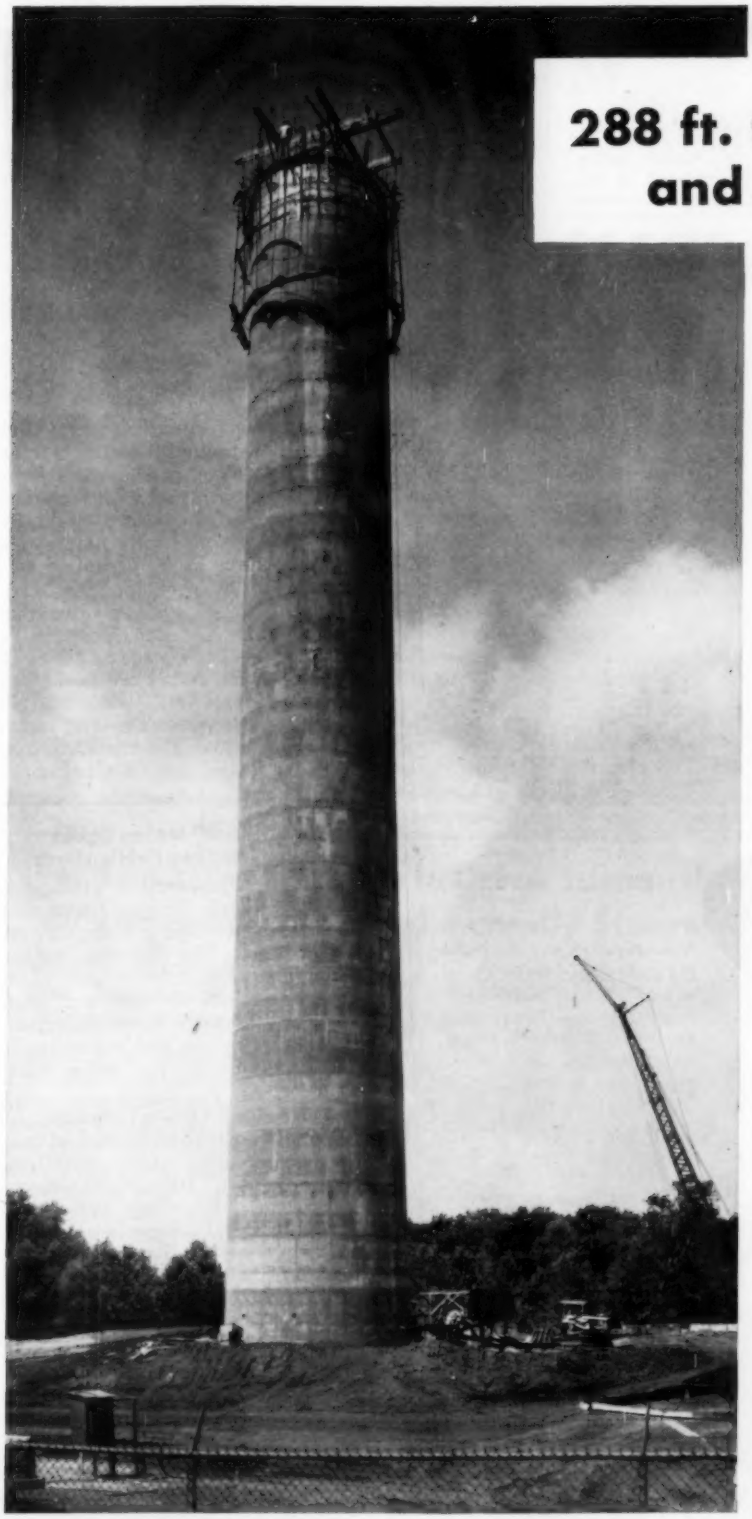
As a result of reports that members are encountering specifications limiting the moisture content of concrete block to values below 30 percent of total absorption, the National Concrete Masonry Association has issued Technical Bulletin No. 3. It deals with the practical difficulty—and under some conditions the impossibility—of producers complying with excessively stringent moisture limitations.

The bulletin calls attention to the fact that concrete block will tend to lose or regain moisture from the air until it reaches an equilibrium moisture content. It also points out that specifications limiting the moisture content of concrete block to a value below this equilibrium moisture content corresponding to the average relative humidity in the area where the block will be used, are impractical and often impossible to enforce.

Information on the relationship between the equilibrium moisture content of the block and the relative humidity of the air is included in the bulletin, as well as a table showing the latter at many points throughout the country.

Cretex Corporation, Minneapolis, Minn., manufacturers of concrete culverts, has made Robert Longfellow, of Alexandria, Minn., a member of the board of directors. The company has 20 factories in Minnesota, N. Dakota, S. Dakota, Iowa, Montana and Wyoming.

288 ft. tall, air-cooled and cost-saving



Concrete shell stacks up to 732' high have been constructed by the method here being used for Picway Generating Plant of the Columbus & Southern Ohio Electric Co. One-yard concrete bucket, operating inside the stack and controlled from the rising platform, places material for each 7'6" stage. Rust Engineering, Pittsburgh, Pa., designers.

You can build a power generator stack like this with only 6" of firebrick inside an inexpensive shell of concrete — provided you allow a 6" space between the two, vented top and bottom for draft cooling.

Part of the economy of this design is its low cost construction. One set of 7½' forms, easily tapered by removing staves, was used to step-pour the entire 288' above ground, in daily stages. The forms were moved each morning and new concrete poured at mid-day.

The first section, of 27' diameter, and 20" wall thickness, heavily reinforced, required a 4½ hours' pour of 26 cu. yds. of concrete. The final top section, of 16' diameter and 6" wall thickness, needed only 5¾ cu. yds. of material and was poured in 20 minutes.

The obvious inefficiency of maintaining a mixing crew for such widely varying requirements was avoided by using ready-mixed concrete. Starting with six daily deliveries and gradually diminishing to one, 400 cu. yds. of concrete were poured over a 44 day period. Each batch was on schedule and produced to rigid specifications in truck mixers of certified design, capacity, mixing speed and accuracy of water control.

You have a right to insist on this Rating Plate. It certifies compliance with the high industry standards maintained for your protection by the Truck Mixer Manufacturers Bureau.

BLAW-KNOX EQUIPMENT DIVISION
Pittsburgh, Pa.

CHAIN BELT COMPANY
Milwaukee, Wis.

CHALLENGE MANUFACTURING CO.
Los Angeles, Calif.

CONCRETE TRANSPORT MIXER CO.
St. Louis, Mo.

CONSTRUCTION MACHINERY CO.
Waterloo, Iowa

IMPERIAL CONSTRUCTION EQUIPMENT CO.
Melrose Park, Ill.

THE JAEGER MACHINE COMPANY
Columbus, Ohio

THE T. L. SMITH COMPANY
Milwaukee, Wis.

WILLARD CONCRETE MACHINERY CO., LTD.
Lynwood, Calif.

WORTHINGTON CORPORATION
Plainfield, N. J.

Concrete Roof Tile

(*From page* 228)

plain side of the tile is stamped "top" to prevent errors on the job, and the slabs are stacked edgewise on pallets for further curing. Each pallet contains 13 tile. In winter the pallets remain inside for a week, after which the tile is restacked 24 to the pallet and transferred to the outside storage yard. In summer the slabs are taken to the yard each day to eliminate one handling.

Because air space must be provided between the stacked tile, the pallets are not used for shipment. They are lifted to truck floor level by fork-lift, and the tile is piled inside flat by hand, with the plain side uppermost—the same position it will be installed on the roof. At the site the slabs are placed by hand on a conveyor to the roof.

Neville Concrete Pipe Company is a wholly-owned subsidiary of the Pittsburgh Coke & Chemical Company, and started operations in 1946 with the mass production of culvert and sewer pipe. Shortly afterwards other products were added: concrete block, Dox floor and roof systems (lightweight hollow cast concrete beams), and such specialty items as reinforced concrete stepping stones, cribbing, and mile marker posts for oil lines.

A typical ceiling constructed of Neville-made vermiculite concrete roof tile. This one is in a school at New Castle, Pa.

Pipes with diameters of 12 to 60 in. are produced with two tamper-type machines. Pipes 60 to 84 in., in diameter are made by the Vibrocast method. All materials are handled with mechanical equipment. Gravel, sand, cement, and lightweight aggregates are batched and fed into the various mixers by material-handling trucks, and the pipe is yarded and loaded with fork-lift trucks and yard cranes.

The mechanized concrete block division produces concrete, cinder, and lightweight blocks in a number of shapes and sizes. The mixed concrete is elevated to the top of the automatic block machine and flows down into forms, where it is packed by vibration. The formed blocks are conveyed automatically to the kiln and are cured by live steam.

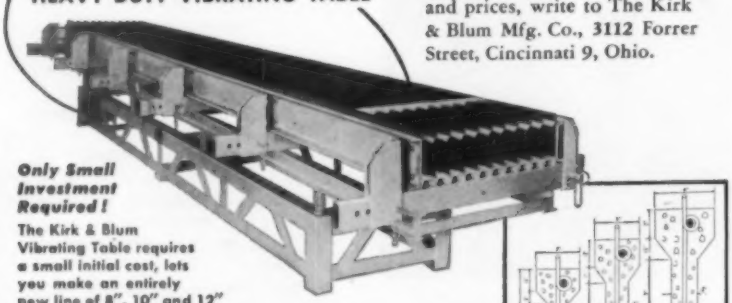
The addition of the Dox floor and roof beam systems fitted into the Neville operation nicely, since these units can be made on the block machine. The beams are made 6 or 8 in. thick, 16 in. wide, and in lengths up to 25 ft. The firm makes the planks and also furnishes men and equipment for installation.

Add a New Profit-Maker

increase your volume

PRODUCE CONCRETE JOISTS, LINTELS AND FENCE POSTS with the KIRK & BLUM HEAVY DUTY VIBRATING TABLE

Your experience in the building trade should make it easy to build up a profitable business in this new line. The products are simple to make, have unusual strength, are termite proof. The KIRK & BLUM Type "S" Heavy Duty Vibrating Table is capable of multi-production of concrete joists, allowing a fine profit-margin. Easily produced by unskilled operators. For complete details and prices, write to The Kirk & Blum Mfg. Co., 3112 Forrer Street, Cincinnati 9, Ohio.



Only Small Investment Required!

The Kirk & Blum Vibrating Table requires a small initial cost, lets you make an entirely new line of 8", 10" and 12" joists in 20 and 24 ft. lengths.

KIRK & BLUM

Manufacturers of steel forms of all types . . . Curb, Gutter, Sewer, Road

"Besser Block" Makes Debut Among Company Publications

An attractive company publication —*Besser Block*—is being issued each month by the Besser Company, Alpena, Mich. The illustrated pocket-size publication contains news of the concrete block industry and those who are in the business. There are also items on new and proved equipment developed for better block making.

The April (Easter) number, for example, covered topics such as modern heat treating, quality control, the control heat, adjusting links, cooperative advertising, and safety notes. Elmer C. Adair is editor, and R. F. Hastie is Besser advertising manager.

John C. Fitch was recently elected vice-president of the George Rackle and Sons Company and general manager of the firm's Southwest Division. Before joining Rackle and Sons, Mr. Fitch was associated with Stone & Webster, Inc., in Philadelphia and New York. When the Rackle firm established its Southwest Division in Houston in 1949, Mr. Fitch was appointed sales manager. In 1952 he was named manager of the Houston manufacturing plant.

TRUCKSTELL ON THE JOB NEWS

THE FINEST IN *ENGINEERED FOR-THE-JOB* TRUCK EQUIPMENT

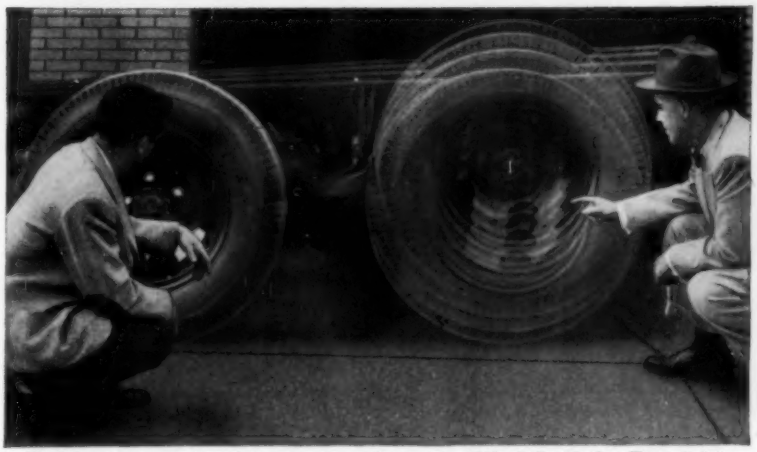
HYDRO-TRAC PROVIDES CAB-CONTROLLED TRACTION

Maximum Payload Capacity; More Work Miles per Day; Greater Tire and Gas Savings!

Operators on many types of 6-wheel hauls—dump, tank, lumber, van, semi-tractor—report that their Truckstell-Willock Hydro-Trac Trailing 3rd Axles are hitting new performance and economy highs.

Hydro-Trac supplies 50-50 axle load distribution for greatest payloads, up to 80-20 *cab-controlled* distribution for maximum traction, trailing axle up for fast, economical return trips, empty.

Weight is shifted hydraulically by quick-acting, cab-controlled pump. Less weight, less cost, more payload, more profit. Models engineered for all makes of trucks and types of drives!



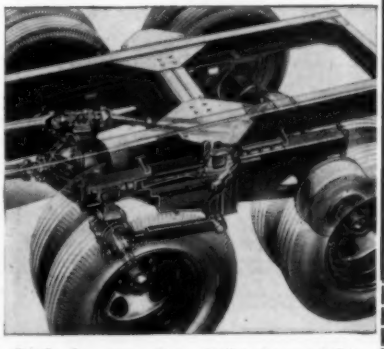
To get extra traction, driver can transfer up to 60% of the Hydro-Trac Axle's load to the driving axle . . . providing highway traction equal to a dual-axle drive, at far less cost. As stop-motion picture shows, axle can be raised off road when truck is empty, giving single-axle advantages on return trips.

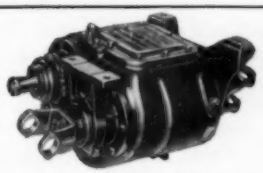
New Truckstell Dual-Axle Drive Suspension Cushions the Ride and Actually Steers!

Truckstell combines Tandem-Trac Suspension with its 3-Speed Power Divider

Engineered for rugged dual-axle jobs, Truckstell keeps tandem wheels tracking on straightaways, guides them on curves. Variable rate, 2-stage springs give gentle cushioning whether truck is empty or heavy laden. Of rocking-chair bearing design, there's nothing to wear out, no need for lubrication ever!

All the auxiliary gearing needed for added gear splits is provided by the 3 gear ratios built in the Power Divider's single gearbox. Single- or dual-axle drive selection can be made instantly, at any speed. Low in cost, high in capacity, light in weight, engineered to fit your specific jobs.





3-Speed Auxiliary Now Available With Built-In Power Take-Off

Ideal for mounting under cab. Designed for those who need extra power and gear splits . . . plus full engine torque, variable speed P. T. O. easily accessible to all power-operated units! Optional gear-ratio combinations available!

Swivel Frame Increases Traction, Maneuverability, Driving Ease

Permits the front and rear halves of a truck to rotate independently. Inexpensive, strong, and light in weight. All wheels are kept firmly on ground. Frame stress and steering wheel fight are eliminated. Maneuverability and traction increased! Models available for all make trucks, ½ ton and up.

Truckstell Manufacturing Company
Dept. O-29, Union Commerce Building
Cleveland 14, Ohio

Rush me complete information on the following Truckstell products I've checked.

☐ Dual-Axle Drive ☐ Swivel Frame

☐ Hydro-Trac 3rd Axle ☐ Auxiliary and P.T.O.

Name_____

Firm_____

Address_____

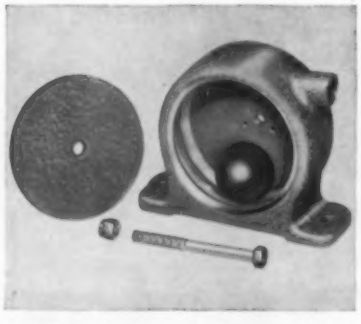
AiroViber Moves Bulk Materials Successfully Regardless Of High Temperatures

This simple ball type pneumatic vibrator operates dependably and effectively although exposed to temperatures between 600 and 750 degrees.

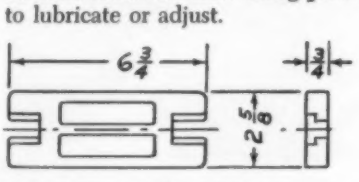
A West Coast plant of Barium Products Ltd reports they experienced a problem in moving materials from bins to electric furnaces, each bin being located adjacent to the furnace it feeds. To encourage free flow, it was decided to utilize vibration. Two Model B15 AiroViber vibrators on each bin operating in temperatures approaching 750 degrees produce desired movement of materials. When fully loaded, a bin weighs approximately 40 tons.

Barium found Viber's Mounting Plate No. 6006, to be advantageous because solid mounting of vibrator on bin increases effectiveness of vibration.

This modern method of external vibration can be used to good advantage in loading, unloading, moving, packaging, processing, grading or separating bulk materials. The simple design provides only one moving part, a heavy steel ball running on a circular track. Fool-proof operation is afforded because it has no close fitting parts to lubricate or adjust.



AiroViber's simple construction requiring no close clearances assures trouble-free operation.



Optional mounting plate simplifies mounting. Two T-slot bolts hold vibrator solidly against plate.

AiroViber is a product of Viber Company, leader in the field of vibration. For further information write: Viber Company, 726 South Flower St., Dept. 78, Burbank, Calif.

VIBER

CONCRETE VIBRATORS SINCE 1931

Tony Loveall

Tony Loveall, who for the past two years has been in the field force of Construction Machinery Companies, has returned to the home office in Waterloo, Iowa, to assume new duties as vice - president and general manager of Construction Machinery Sales Company.

Mr. Loveall is a graduate engineer, graduating from Iowa State College in 1951. Immediately after graduation he served in Air Force research and development work.

After completion of his Air Force duties, he continued to reside in Dayton, covering the East-Central territory for CMC. His return to Waterloo is a step in the expansion program now in progress, according to George A. Loveall, president of Construction Machinery Sales Co.

Charles Ector

E. T. Keck

The Gene Olsen Corporation has announced an addition to their sales staff and new territories for another.

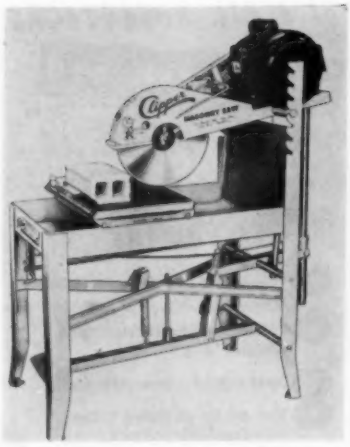
E. T. Keck has been appointed to the GOcorp sales staff as the firm's representative in most of Florida, eastern Georgia, North and South Carolina. Charles Ector has been assigned the territory of Mississippi, Arkansas, and Louisiana in addition to northwestern Florida, and western Georgia which he has been servicing.

Directors of the Kent Machine Company, Cuyahoga Falls, Ohio, have approved a purchase offer from the Lamson & Sessions Company, Cleveland, Ohio, which would be in the form of an exchange of stock worth more than $360,000, according to the M. K. DeWitt, Lamson secretary.

A meeting of Kent Machine stockholders has been called for July 8 to vote on the approval. Mr. DeWitt said there would be no change in personnel of Kent Machine.

CM New Machinery and Supplies

● Utility Trailer Mfg. Co.'s design engineers have developed the above versatile hauling unit. The special combination set of trailers can be used to deliver any type of material or concrete units, etc. Faster loading and unloading of the blocks is achieved by a gasoline motorized traveling elevator. A pallet load can be handled, without pallets, being raised from the ground and carried forward by this elevator for placement on the trailer. Double stacking can be done. Special gondola bodies are utilized by lifting the trailer floor, which forms gondola sides, for filling with bulk materials. This makes it possible to deliver raw materials to the plant and use the same equipment to deliver finished units to the job. ↟ (101)



● The new Super Model masonry saw offered by Clipper Mfg. Co. incorporates all the features of the standard models, and is designed specially for low-cost production cutting of every masonry material, regardless of size. It has a 2-hp. continuous duty motor, large heavy-duty shafts and oversize bearings, mounted on a more rugged cutting head, of both 14-in. and 18-in. capacities. Super models are equipped for wet-and-dry cutting or for dry cutting only, and can be easily converted to a concrete or track saw. ↟ (102)

● A newly designed automatic, electronic moisture control unit for concrete block plants, offered by Edick Laboratories, Inc., can be easily installed, computes water content and maintains the water content. This assures uniform batches regardless of the water content of aggregates being used. ↟ (103)

● Excellent packaging of Blok-Lok wall reinforcing has been done by the A-A Wire Products Co. Bundles hold 300 linear feet (25 pcs.) of 12-ft. lengths or 250 ft. of 10-ft. lengths, plainly tagged and stencilled. The reinforcing comes in four types—Heavy Duty (3/16 gauge side rods x 9 gauge cross rods); Special Standard (8 gauge x No. 10 gauge); Standard (9 gauge x 9 gauge); and FS-Standard (8 gauge x 12 gauge). ↟ (104)

SEPTEMBER, 1955

MORE INFORMATION PLEASE

THE CONCRETE MANUFACTURER
431 S. DEARBORN ST.
CHICAGO 5, ILLINOIS

Please send more information on items described in editorial columns of this issue, as circled below.

101 102 103 104 105 106 107 108 109 110
111 112 113 114 115 116 117 118 119 120
121 122 123

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

Get 4 BIG ADVANTAGES

with Servicised

White Pigmented Concrete Curing Compounds

1. Fast, positive coverage... no missed spots
2. Reflects heat—reduces concrete temperatures 15° F.
3. Saves material... no waste or overlap
4. Does not run on sloping surfaces—"stays put" after application

Servicised White Pigmented Curing Compound is widely used in areas where atmospheric temperatures exceed 80° F. because it produces a membrane capable of reflecting heat to reduce concrete temperatures as much as 15° F. Even application, using minimum material and application time. May be sprayed or brushed.

Write for complete details and circular on Servicised Concrete Curing Compounds.

SERVICISED PRODUCTS CORPORATION
6051 West 65th Street, Chicago, Illinois

ECONOMY Steel Forms
for concrete construction
available on a
RENTAL BASIS

Use this nation-wide form rental and supervisory service for your concrete forming needs. Saves time, labor, material. For complete details...

WRITE FOR NEW CATALOG

And ask, too, about *Special Economy Steel Forms* and *EFCO "Lifetime" Steel Forms* available on a purchase basis.

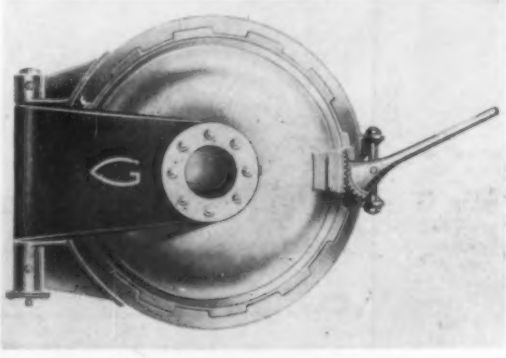
ECONOMY FORMS CORP.
HOME OFFICE • DES MOINES, IOWA

DISTRICT SALES OFFICES: St. Louis, Mo. • Kansas City, Mo. • Lincoln, Nebr. • Minneapolis, Minn. • Ft. Wayne, Ind. • Milwaukee, Wis. • Cincinnati, Ohio • Cleveland, Ohio • Metuchen N. J. • Springfield, Mass • Rochester, N. Y. • Washington, D. C. • Decatur, Ga. • Dallas, Texas • Los Angeles, Calif. • Oakland, Calif. • Denver, Colo.

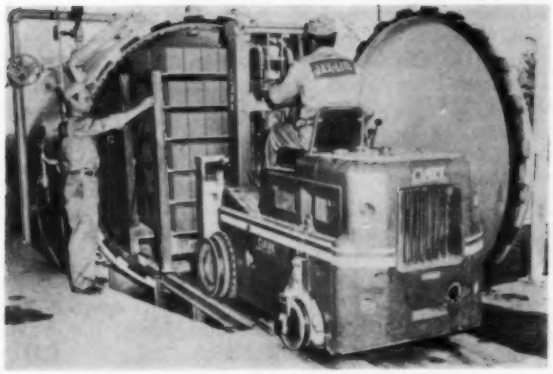
● Many new features are incorporated in the new 6-cu. yd. Hydro-mixer of Concrete Machinery Sales Corp. The new hydraulic drum drive is powered by a front-mounted, two-speed power take-off. With a weight of only 7,100 lb. maximum payload and extra water capacity can be obtained. Functions are controlled by a simple 2-way hydraulic valve. ← (105)

● A new small-sized Valsafe blade, by Victor Engineering Corp., has a fiber bushing in the arbor of the blade which adopts it for use on any make portable electric or table saw. The design utilizes several layers of fibreglass and abrasive to produce an extremely strong, break-resistant blade of long life. ↑ (106)

● "Uni-Coat" rust preventive coating is announced by Universal Door Carrier, Inc. It resists abrasion and is impermeable to water, steam, grease, most solvents, acids and alkalies. Can be applied over old rust for corrosion resistance. ↑ (107)



● Gussett Boiler & Welding, Inc., has designed a new quick-opening door which employs a large diameter boss on which the rigid, light-weight all-fabricated door rotates to engage the lugs for sealing. Ranging from 8 in. to 24 in. in diameter, it provides many times the bearing area possible with small-diameter pins formerly used. Despite the greatly increased bearing area, the new unit is said to rotate freely on the large gun-lubricated bronze bearing. ← (108)



● Flanged wheels attached to the "Utilitruc" of Clark Equipment Co. by a customer, permitted added flexibility in using these regular fork truck units. Front flanged wheels are bolted to the regular wheels, while rear flanged wheels are supported in a "U"-block, bolted to the fork truck frame. The flanged wheels clear the floor by several inches when the "Utilitruc" is traveling in normal manner. ↟ (110)

● Champion Mfg. Co. offers the new "Con-Flex C-300" low-cost blade for cutting of very green concrete (6 to 12 hours old) with slag, limestone or dolomite aggregates. The firm produces a complete line of concrete and masonry saws and blades, including the famous "Self Propelled Concrete Saw". ↟ (111)

● Industrial Radio Corp. announces the Model J Pak-Fone 2-way radio operating on 6-, 12-, 24-volt d.c. or 115 v.a.c. sources without separate power supply. Unit is only 10 in. high by 9 in. deep by 5 in. high. Loud speaker and power supply are built in. ↟ (112)

● Formerly made by LeRoi Division, a new line of truck mixers is now offered by the Adams Division of LeTourneau-Westinghouse Co. The truck mixers are available in five sizes from 4½ to 6½ yd., using Continental engines. ↟ (109)

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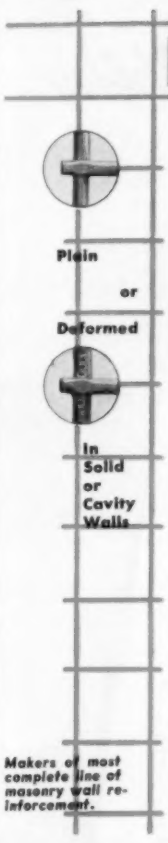
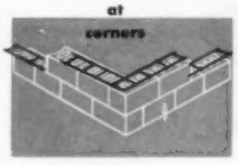


FLUSH-WELDED JOINTS—STRONGEST BY COMPARISON

Prefabricated
PARTITION-LOK

Prefabricated
CORNER-LOK
at
corners



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Flush Welded Joint

BLOK-LOK neatly and securely bundled in heavy weight cardboard wrappers, 300 linear ft. per bundle.

Finishes

Galvanized wire, hot-dipped galvanized and brite basic.

BLOK-LOK Standard 9 gauge steel wire

BLOK-LOK Special Standard 8 ga. deformed side rods, 10 gauge galvanized cross rods, 16" centers

BLOK-LOK Heavy 3/16" rod with 9 ga. cross member

FS-Standard 8 ga. deformed side rods by 12 ga. cross rods flush welded on 16" centers, all galvanized wire.

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Extensive testing laboratory reports serve to confirm the sound engineering of Blok-Lok's design. Exceeds requirements of A.S.T.M. specifications A-82-34 and A-15-52T.

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New Literature

A HOIST for places where head room is a problem, hoist whipping is breaking block, or where the operator must fight a tilted cradle is available from the *Bergen Machine & Tool Co., Inc.* Their Model No. 9033 hoist requires only 13 ft. head room, and incorporate many features to eliminate problems in your block making. **(113)**

WELDED WIRE FABRIC use in reinforced concrete building construction has been covered in this new design manual prepared by *Wire Reinforcement Institute, Inc.* The new manual includes comprehensive design data and recommendations on many applications of fabric in concrete. **(114)**

HIGH STACKING in low ceiling areas is greatly facilitated with the new optional-feature high free lift mast now available on *Towmotor* models LT-35, 500, LT-50, LT-56, and 500-P. There is no reduction in load capacity or increase in load lever arm over standard trucks when this feature is incorporated. **(115)**

TESTING EQUIPMENT made by *Forney's Incorporated* is described in these three latest bulletins. They feature the QC-200, a 200-ton tester for blocks or cylinders; the QC-100-S, a compression and flexure testing machine for 6- by 12-in. cylinders; and the LT-500, a compression and flexure tester for blocks up to 8- by 18-in. Accessories enlarge the scope of the machines. **(116)**

PIPE MARKERS for pipes carrying all types of products are available from the *W. H. Brady Co.* Their markers stick to pipes ranging from —300 deg. F. to 300 deg. F. Over 1000 different pipe markers are carried in stock. **(117)**

LIFT TRUCK selection is discussed in this reprint of an article by Harry G. Meister of the *Hyster Co.* It is a new kind of analysis guide and rating table for such equipment. Thirty-six lift truck features are listed for comparison. **(118)**

STEAM HOSE LINE which is burst-proof has been introduced by the *Aeroquip Corp.* The line, which is claimed to give longer life, greater efficiency, and maximum safety, is available with a grease-resistant cover. **(119)**

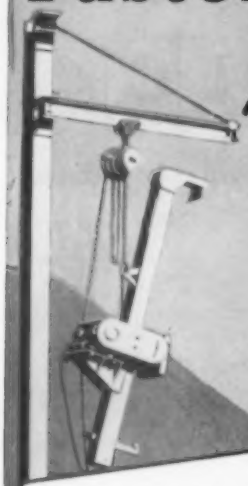
HOISTS ranging in capacity from 250 to 2000 lb. are available now from the *P&H Hoist Div. of the Harnischfeger Corp.* The line features two brakes—a motor brake and a load brake, either of which will hold the full load. A full 10 ft. lift is standard, with 14, 18, and 20 ft. lifts optional. **(120)**

FRONT PALLET RETURN that is automatic has been made available by the *Kent Machine Co.* It makes any Kentwin a more efficient, dependable, economical one-man machine. Models are available for all pallet sizes down to 18- by 18-in. **(121)**

BATCHING OPERATIONS are speeded by using the *Dravo-Doyle* Cem-Matic cement box. They secure a fast, smooth, and accurate batching of cement with aggregate, and are weather tight, rugged, and easy to load. **(122)**

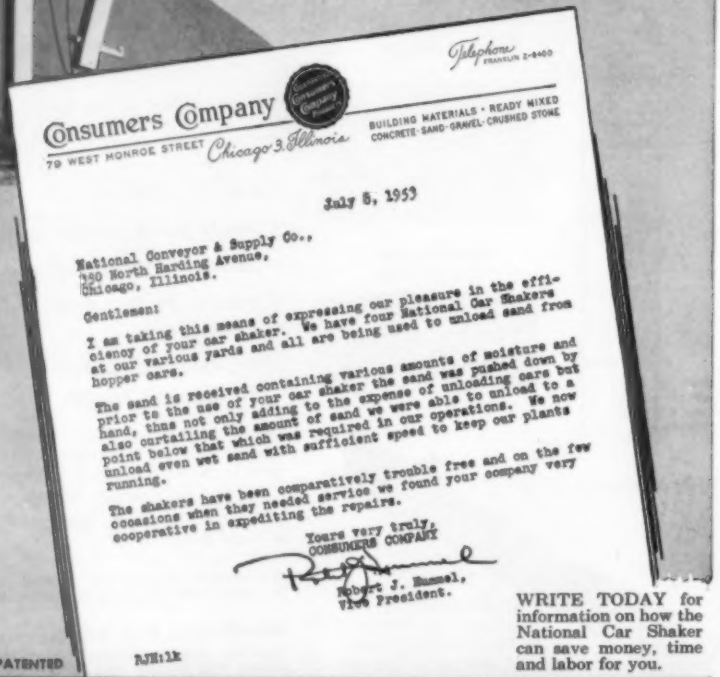
WATER-REPELLENTS for concrete which are manufactured by the *Medusa Portland Cement Co.*, are listed and described in this brochure. Detailed specifications for making many types of constructions water-repellent are included. **(123)**

Faster Unloading with the *National Car Shaker*



FASTER, SAFER, LOWER-COST UNLOADING with the *low cost* National Car Shaker. Unloads a car in as little as six minutes with no man required in or under the car, under normal conditions. Unloads coal, coke, cinders, sand, stone, aggregates and all bulk materials.

Used and time-tested by hundreds of firms, both large and small. The time saved by Consumers Company, (see letter below) is typical.



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Consumers Company
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BUILDING MATERIALS • READY MIXED CONCRETE · SAND · GRAVEL · CRUSHED STONE

July 8, 1955

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CONSUMERS COMPANY
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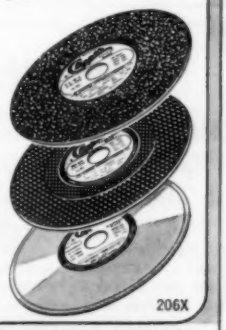

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New OSWALT BLOCK MACHINE Sets Standards for

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Write us for details or visit our plant and see the OSWALT Block Machine demonstrated under actual working conditions.

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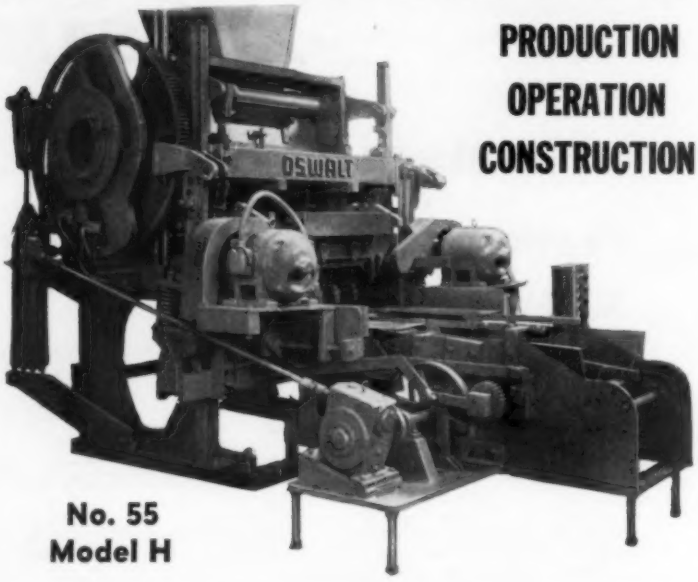

No. 55
Model H

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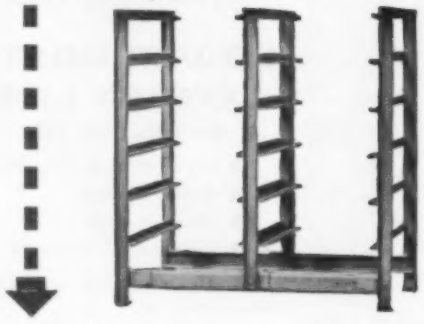
CHASE BLOCK RACKS, PLAIN STEEL PALLETS

Your best buy



Here's why • • • Standard style or specially designed, Chase racks meet your requirements. They're shipped painted and knocked down—assembly is easy—no special tools or welding needed. Chase experience means low prices and years of dependable service. Check Chase prices.

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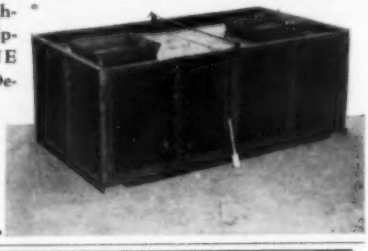

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At right is one of our low-cost, highly profitable items . . . a strong, pre-stressed concrete post made from one of our lightweight steel forms. Easily set up. Requires no power.

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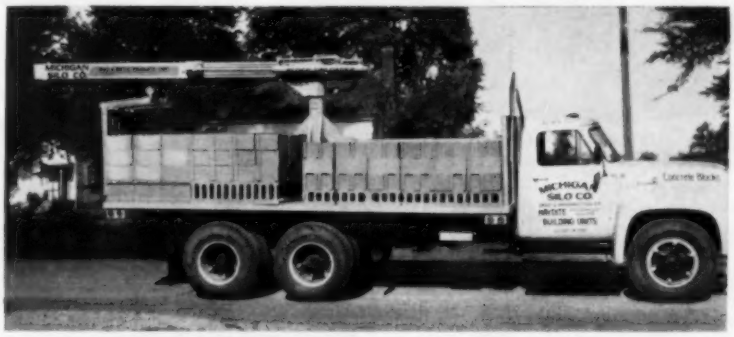

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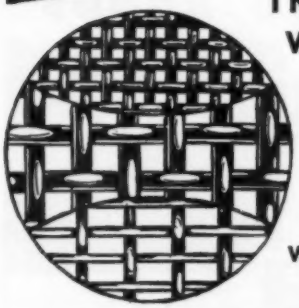

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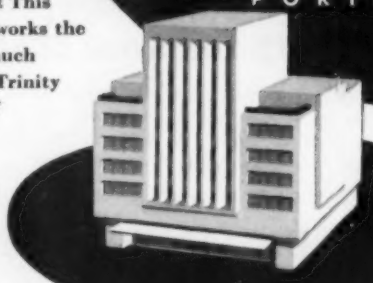

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IT TURNS IN THE MIDDLE— TAKES THE CORNERS LIKE A BREEZE

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TUFHORSE KANT-RIP hand pads and mittens are specially made for handling concrete blocks and other concrete products. Made of the finest quality cowhide, Tufhorse hand pads and mittens are tough, flexible, never get hard and brittle.

Order on open account today. Sample pairs at the "per dozen" prices.

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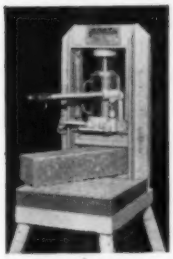

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Indispensable tool for on the job. Trims off the end of any block up to 8" by hand operated, hydraulic pump. Capacity 12 tons. Legs easily removable. Compact. Lightweight. Easily portable.

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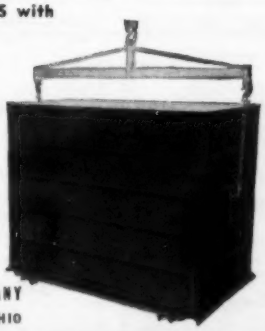

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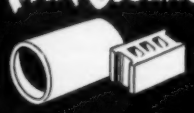
(IN 2 MINUTES)
for curing Blocks and Pipe with the **Littleford "KWIK-STEAM"** *Vapor-Clarkson Generator*



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fully automatic

steam where you want it

operates at full or half capacity

steam when you want it

sizes from 20 to 165 BHP

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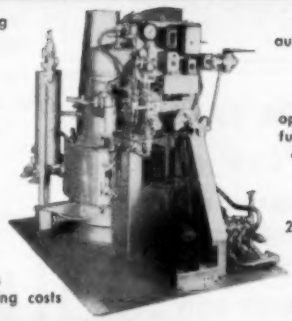

You get steam in 2 minutes flat from a cold start with the Littleford "Kwik-Steam" Generators. And you save real money on concrete manufacturing costs, because the "Kwik-Steam" reduces labor costs 50% (no skilled labor required) and speeds up the curing cycle. There's a size for your plant. Send for descriptive bulletin.

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Successful Block Plant, located in the heart of a booming section in New Jersey. Over 2½ million block were manufactured in 1954. Gross receipts showed $500,000.00. This plant is only two years old. The latest in up to date trucks and Block Plant machinery.

For further details write

BOX CM-902, c/o THE CONCRETE MANUFACTURER
431 S. Dearborn St. Chicago 5, Ill.

FOR SALE

Ready Mix Concrete Plant in growing northern Calif. Community. Good business, year around operation, no competition. 1954 gross $83,000.00.

For details write
STANLEY W. WRUCK
P.O. Box 681 Willows, Calif.

Plant Layout Design Block Machinery

WITTEMANN MACHINERY COMPANY

FARMINGDALE, NEW JERSEY

Specialists in Concrete Products Equipment

Eastern Representatives of the

COLUMBIA MACHINE WORKS, Vancouver, Washington

Elevators Bins Conveyors Feeders

WANTED

Engineer thoroughly experienced in Ready-Mix Concrete Plant design, by expanding mid-western manufacturer. Present organization knows of this ad.

Box CM-909, c/o PIT AND QUARRY PUBLICATIONS
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PRESTRESSED CONCRETE FRANCHISE

Lakeland Engineering Associates' proven designs for floor slabs, roof deck, joists, beams, bleachers, and bridge decks, available for manufacturing under L E A P exclusive franchise. Write for details.

LAKELAND ENGINEERING ASSOCIATES, INC.
Lakeland, Florida

FOR SALE

Small Block Plant

1 Rockercrete Vibrator Block Machine
30 Steel Block Racks
2000 8x8x16 Pressed Steel Pallets
2000 4x8x16 Pressed Steel Pallets
2000 6x8x16 Cast Iron Pallets
3 Mould Boxes, 4", 6" & 8"
1 5-Horsepower Air Compressor

This equipment is in good shape. Priced at $2500.00 for quick sale. Plant capable of producing 1800 8" Units daily.

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Box 389 Altavista, Virginia

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Large mineral deposit of yellow iron oxide for coloring cement; located in northern Ill. Very uniform in color. Can be turned red by heating at low temperatures. Can be mixed with blue to make green.

Those interested write to

STANLEY SCHNEIDER
Rt. #3, Box 75 Elgin, Ill.
More information upon request.

MINERAL COLORS

for

BRICK MORTAR
STUCCO-PLASTER-CONCRETE

"Fine Because of Their Fineness"
Ask for samples and recommendations.

BLUE RIDGE TALC CO., INC.
HENRY, VIRGINIA

FOR SALE

NEW LOW PRICE

NEW YELLEN Hi-SPEED
PLAIN PALLETT
BLOCK MACHINE
THE NEWEST LOW COST
PLAIN PALLETT MACHINE
THOROUGHLY TESTED
PROVEN

JOHN J. YELLEN
PERTH AMBOY, N. J.

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CONCRETE MANUFACTURERS • READY-MIX PRODUCERS

HAVING A CEMENT STORAGE PROBLEM?

I have cement silos with cap from 300 bbl. to 1000 bbl. all welded seamless construction (divided compartments if desired) legs, hatchway, vent, elevator connection, inside and out ladders, painted, shipped in one piece, no erection problem.

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SYRACUSE, N. Y. **Phone: 73-1514**

GEORGE W. HOFFMANN CO.

P. O. BOX 452

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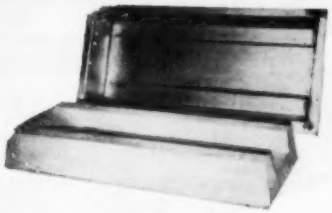
Concrete Pipe Forms & Vibrators

TO THE HIGHEST BIDDER—We are offering the following items of equipment, recently obtained from Pacific Brick & Block Co., Pacific Missouri, to the highest bidder. F.O.B. Holland, Michigan. All bids must be in our possession on or before October 1st, 1955. All items listed, except pallets, may be seen at our plant in Holland, Michigan:

1—L-5 Lith-I-Block Machine Set-Up for 8x8x16 Modular Stringer Block (Ser. #12022 purchased March 25, 1953).
1—Air Motor Off-bearing device.
1—Model D Truckman W/Std. 27" x 54" Platform Ser. #3033-W—Motor #1886081—Purchased March 25, 1953.
1—8x8x16 Full Header Attachment (Mold-box type).
1—4x8x16 Attachment (Including mold box).
1—50 Cu. Ft. Gatzke Batch Mixer W/40 H. P. motor (Purchased March 25 1953).

LITH-I-BAR COMPANY
HOLLAND, MICHIGAN

MOLDS FOR CAST CONCRETE



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- "IDEAL" STEP-TREADS
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- VIBRATING TABLES

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Stearns Model 15 Block Machine Complete with Automatic Pallet Return, Oiler, Magnetic Off-bearer and Attachments for 4, 8 and 12" block, brick and half height, also a quantity of spare parts. Equipment originally cost $42,000.00 new, late 1950. In excellent condition, priced for prompt sale.

Reply Box CM-302 c/o THE CONCRETE MANUFACTURER
431 S. Dearborn St. Chicago 5, Illinois

FOR SALE

Several 6' diam. turn tables, good as new. Unused link-belt chain, No. 488, with K2 attachments and buckets, somewhat rusted. Steel pallets, 1/4"x25"x18 1/2" @ $1.25 each.

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PLAIN STEEL PALLETS

Guaranteed Quality
Flat • Square • Accurate
GARY STEEL SUPPLY COMPANY
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COLORS *For Cement and Concrete*

COLOR YOUR CONCRETE WITH LANSCO CEMENT COLORS, available in 40 ATTRACTIVE shades. Suitable for all types of concrete products. Write for our new color card, copy of "Suggestions For Using Cement Colors", and for free samples and price list.

Manufactured by:

LANDERS-SEGAL COLOR CO.
71 Delavan St. • Brooklyn 31, N. Y.

GERSON'S GOOD WILL BUILDERS

ADVERTISING NECESSITIES FOR THE BLOCK INDUSTRY. LINE PINS, TWIGS, CORNER BLOCKS, CALCULATORS.
Complete Catalog on Request.
GERSON CO.
97 Deering Rd.
MATTAPAN 26 MASS

FOR SALE

Besser Super Vibrapac. Excellent condition. 30" Gardner Double Spindle Grinder. Block racks 72—8" block per rack.

BOX NO. CM-405, c/o THE CONCRETE MANUFACTURER
431 S. Dearborn St. Chicago 5, Ill.

PLAIN PALLET CLEANING

We truck our machine to your plant and supervise entire cleaning and shearing off of pallet residue. No need to shut down as we will keep up with production.

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Phone: Venice 9-4131

STOP that WATER

With FORMULA No. 640

A clear liquid which penetrates 1" or more into concrete, brick stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly — no mixing — no cleanup — no furring — no membranes. Write for technical data—free sample.

HAYNES PRODUCTS CO., OMAHA 3, NEBR.

FOR SALE

Classified advertising space in the industry's widest-read magazine—only $11.00 per column inch.

THE CONCRETE MANUFACTURER
431 S. Dearborn St. Chicago 5, Ill.

FOR IMMEDIATE SALE

Complete Ready Mix Concrete Plant. No competition. $25,000.00 annual net profit. Located in foothills of beautiful Black Hills area. Serving three growing communities plus large oil field operations. $50,000.00 plant, trucks and business.

Black Hills Ready Mix Co.
Newcastle, Wyoming

FOR SALE

Besser Super Vibrapac Block Machine with 4", 8", and 12" attachments, pallets, and racks.

Concrete Products Supply Co.
University at 30th Ave. N.E.
Minneapolis 18, Minnesota

FOR SALE—$4300.00

Model K 47 Hydro-Korpak block machine with 5 HP., 3 Phase, 60 Cy. motor, and attachments to make all standard 8" blocks. 25' Gyro-matic mixer completely equipped with 10 HP. back geared motor, and hoist with 5 HP. back geared motor including magnetic switch for automatic safety stop at top and bottom.

This equipment is in excellent condition and was used for experimental purposes only.

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Phone: LIberty 6-2403

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Fork and platform power lift trucks, used and guaranteed factory rebuilts.

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MINNEAPOLIS 18, MINNESOTA
Phone—Sterling 1-9508

MANY YEARS of PROVEN PERFORMANCE!

NOW-Anyone can repair Concrete easily!

PACKAGING AND DISTRIBUTING FRANCHISES

Welds CRACKS

Bonds NEW CONCRETE to OLD

Stops WATER

Saves TIME-Saves LABOR Saves CEMENT

A SMALL INVESTMENT brings BIG RETURNS

WRITE TO CONCRETE WELD CO. FLINT MICHIGAN

USED BLOCK MACHINES

Stearns Zipper—Jefferson, Wisconsin.
Kent Blockmaker—Saginaw, Michigan.
Two-block Van-U-Matic molds, offbearer and steel plain pallets. $1500.00—Aberdeen, S. D.
Two-block Praschak with 4" — 8" — 10" — 12" molds and pallets. $1200.00.
Stearns Clipper — Conoquenessing, Pennsylvania.
Three-block plain pallet Flam machine, reasonable—Chatham, Ont., Canada.
Besser K-12 with mixer, 3000 steel plain pallets and steel racks. $2500.00 complete—Cannon Falls, Minnesota.
Two-block plain pallet Multico complete with molds, offbearer, pallets and racks. $500.00 down—Mankato, Minnesota.
Jaltcrete No. 9 still operating—Rockford, Ill., Durham, Ont., Canada.
Jaltcrete No. 7—Quincy, Ill., Two Harbors, Minn.
Hydro-Korpac—La Porte, Indiana.
Flemings—Lith-I-Blocks—Columbias.
I also have on hand quite a supply of cored pallets, modular and full size, a few used mixers, boilers, conveyors and bucket elevators. Also I list a few plants that want partners with a little cash and lots of experience.

Mid-Western Concrete Equipment Co.
BOX 646 MUKWONAGO, WISCONSIN

You'll find Vibrapacs are versatile. They not only make conventional block in all types and sizes, and brick 32 at a time . . . they also make Soffit Filler Block for floors and roofs. And the same set of Plain Pallets takes care of ALL units. Write for literature.

BESSER COMPANY
ALPENA, MICHIGAN, U. S. A.
Complete Equipment for Concrete Block Plants

A 8177-¼

3 typical Cases

Case No. 426: Stripping and loading concrete block. Job-fitted coated gloves wore 7 days vs 3 days for leather gloves.

Case No. 137: Outwore heavy canvas 4 to 1, handling block, sand, cement.

Case No. 314: Handling concrete pipe. 28 to 30 hours wear vs 2 to 3 hours with nap-out double palm gloves.

Job-fitted to cut glove costs

No. 304
Double coated palm

Edmont JOB-FITTED GLOVES

If your men are wearing canvas, leather or ordinary plastic work gloves, we can show you substantial cost-savings. Our Monkey-Grip plastic coated gloves are job-fitted for handling concrete products. They include double-thick palm styles that handle as many as 29,000 block per pair.

Free Offer to Employers

Tell us the materials you handle. Without cost we will recommend and send test samples of the glove that best fits the job.

Edmont Manufacturing Co.
1208 Walnut St., Coshocton, Ohio

Now Available . . .

1955 *Edition*

CONCRETE INDUSTRIES YEARBOOK

BIG • FACTUAL • COMPLETE

MAIL THIS HANDY ORDER FORM TODAY

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Chicago 5, Illinois

For the attached check, send me.....copies of the 1955 edition of the Concrete Industries Yearbook.

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. . . incorporating all the latest available information on machinery, equipment and processes

ONLY **$2.00** PER COPY

HYDRA-LIFT UNLOADER

(Patents Pending)

for

EFFICIENT SIDE LOADING. Drop action of horizontal rails permits side loading by lift trucks. Normal carrying position of rails is flat on truck bed. Can be raised to act as guide rails (see picture) when truck stands on hill in unloading.

SAFE DRIVING. Hydraulically operated fold-down of rear overhang makes a compact unit. Eliminates accident hazard. When raised, side braces afford solid support for heaviest loads.

DEPENDABLE, SMOOTH UNLOADING. Rack and pinion drive, exclusive Hydra-Lift feature, assures quick, safe unloading in all weather — on any terrain. Completely hydraulic — powered by truck engine.

UNLOADS TWO CUBES AT A TIME • UNLOADS INTO BASEMENTS • STACKS CUBE ON CUBE

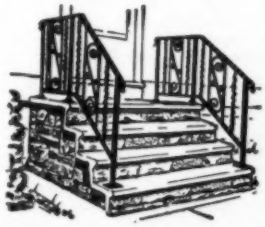
Check the weight! Compare the price!

FOR FULL DETAILS AND PRICES Write or phone:

HAVERSTICK BROS.
2111 Stone Mill Road
Lancaster, Pennsylvania

Mfrs. of BLOCK UNLOADERS for over TWO YEARS

Here is a step in the right direction



PRE-CAST STEPS AND PORCHES IN STONE OR BRICK

Licensor: **SHAWNEE STEP FORM CO.**
BOX 995 TROY, N. Y.

WHEELER TESTING VIBRATOR

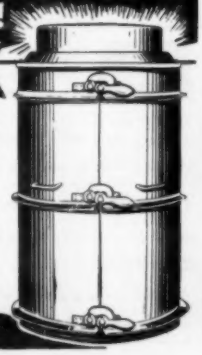
Grades any granular material from 2" in size to 200 mesh.
Designed for sieves from 6" to 16" Dia.
Efficient, self-contained, economical, portable and quiet.
These machines have been specified for the Kansas Turnpike.

For full details write:
WHEELER CO., INC. 2408 Harrison St., Topeka, Kansas
(Distributor Territories Open)

DEPENDABLE
FOR 50 YEARS
Woven Wire
ALLOY SCREENS
TWIN CITY IRON & WIRE CO.
St. Paul, Minnesota

FOR THE FINEST CONCRETE PIPE... YOU NEED FINEST FORMS!

THE Quinn Standard



Backed by over 40 years of reliable service, the QUINN STANDARD is recognized as the finest concrete pipe form the world over. Thousands of pipe manufacturers, from the smallest to the largest, look to Quinn for equipment to produce the finest concrete pipe at the lowest possible costs.

• QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry process. Sizes for pipe from 10" to 120" and larger. Tongue and groove or bell end pipe in any length desired.

WRITE TODAY for complete information and estimates.

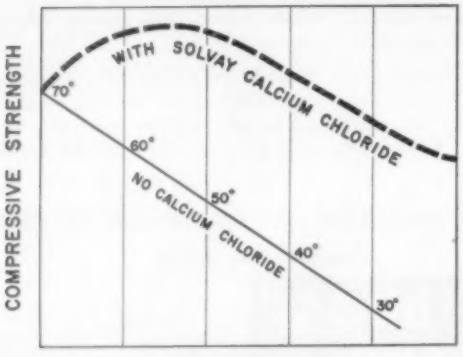
Also manufacturers of QUINN CONCRETE PIPE MACHINES

Quinn WIRE & IRON WORKS
BOONE, IOWA

SOLVAY

CALCIUM CHLORIDE

KEEPS CONCRETE STRENGTH from DROPPING with the TEMPERATURE

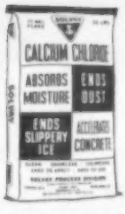


The Addition of SOLVAY CALCIUM CHLORIDE

to Concrete During Cold Weather . . .

• Speeds finishing • Cuts delays between operations • Permits faster removal of forms • Provides greater safety • Assures full strength

NEW 25 LB. BAGS FOR READY-MIX CONCRETE



Easy-to-Handle
•
Assures Accurate Measurement
•
Saves Time

FOR FULL INFORMATION MAIL COUPON

Allied Chemical

SOLVAY PROCESS DIVISION
Allied Chemical & Dye Corporation
61 Broadway, New York 6, N. Y.

Gentlemen:
Please send me — WITHOUT COST OR OBLIGATION:

☐ "When the temperature drops BELOW 50°F., do you know what happens to CONCRETE?"

☐ "The Effects of Calcium Chloride on Portland Cement"

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Company_____

Address_____ Position_____

City_____ Zone____ State_____ CM-9

CONCRETE MANUFACTURER INDEX TO ADVERTISERS

A A Wire Products Co. 257
Adams Division, LeTourneau-Westinghouse, Co. 211
Aluminum Industries, Inc. 259
American Clay Machinery Div. Huber-Warco Co. 249
*Bergen Machine & Tool Co., Inc. 231
*Besser Manufacturing Co. 214, 263, 266, 269
*Blaw-Knox Co. 243
*Burmeister Co. 222
C & W Sales Co. 223
Carpenter Mfg. Co. 260
Chase Foundry & Mfg. Co. 260
Clark Equipment Co. 227
Classified Section 264-265
Clipper Mfg. Co. 259
Columbia Machine Works 245
Concrete Post Form Co. 260
Cook Bros. Equipment Co. 221
Darden Industries, Inc., Roy 234
Des Moines Glove & Mfg. Co. 262
Dow Chemical Co. 225
Dunn Mfg. Co., W. E. 229
Economy Forms Corp. 256
Edmont Mfg. Co. 266
Ehrsam & Sons Mfg. Co., J. B. 259
Erickson Power Lift Trucks, Inc. 262
*Erie Strayer Co. 271
Fanning-Schuett Engrg. Co. 270
Fleming Mfg. Co. 220
*Fuller Co. 242
Griffin, Larry 264
Haverstick Bros. 267
Heltzel Steel Form & Iron Co. 240
*Hoffmann Co., Geo. W. 265
Huber-Warco Co. 249
Ideal Engineering Co., Inc. 265
Jaeger Machine Co. 233
Kent Machine Co. 219
Kirk & Blum Mfg. Co. 252
Littleford Bros. 263
Lone Star Cement Corp. 210
Marsh Engineering Co., E. F. 218
Medusa Portland Cement Co. 235
Mid-Western Concrete Equipment Co. 265
National Conveyor & Supply Co. 258
National Wire Cloth Co. 261
Noble Company 212
Norwalk Vault Co. 263
Olsen Corp., Gene 217
Oronite Chemical Co. 241
Oswalt Engrg. Service Corp. 260
PreCaster, Inc. 223
Quinn Wire & Iron Works 267
Servicised Products Corp. 256
Shawnee Step Form Co. 267
Side-O-Matic Unloader Corp. 261
*Smith Co., T. L. 247
Solvay Process Division, Allied Chemical & Dye Corp. 268
Spillman Co., R. I. 265
*Stearns Manufacturing Co. 272
Surety Rubber Co. 261
Towmotor Corporation 216
Trinity Div. General Portland Cement Co. 262
Truck Mixer Manufacturers Bureau 251
Truckstell Mfg. Co. 253
*Twin City Iron & Wire Co. 267
Viber Company 254
Wheeler Co., Inc. 267
Williams, Roger F. 263
Yellen, John J. 264

*See also Detailed Information in 1955 Pit and Quarry HANDBOOK and CONCRETE INDUSTRIES YEARBOOK

BIGGER PROFITS with VIBRAPACS

Backed by Besser Cooperative Advertising

Bill's block sales are going *down*, because he doesn't have the best facilities for production and promotion.

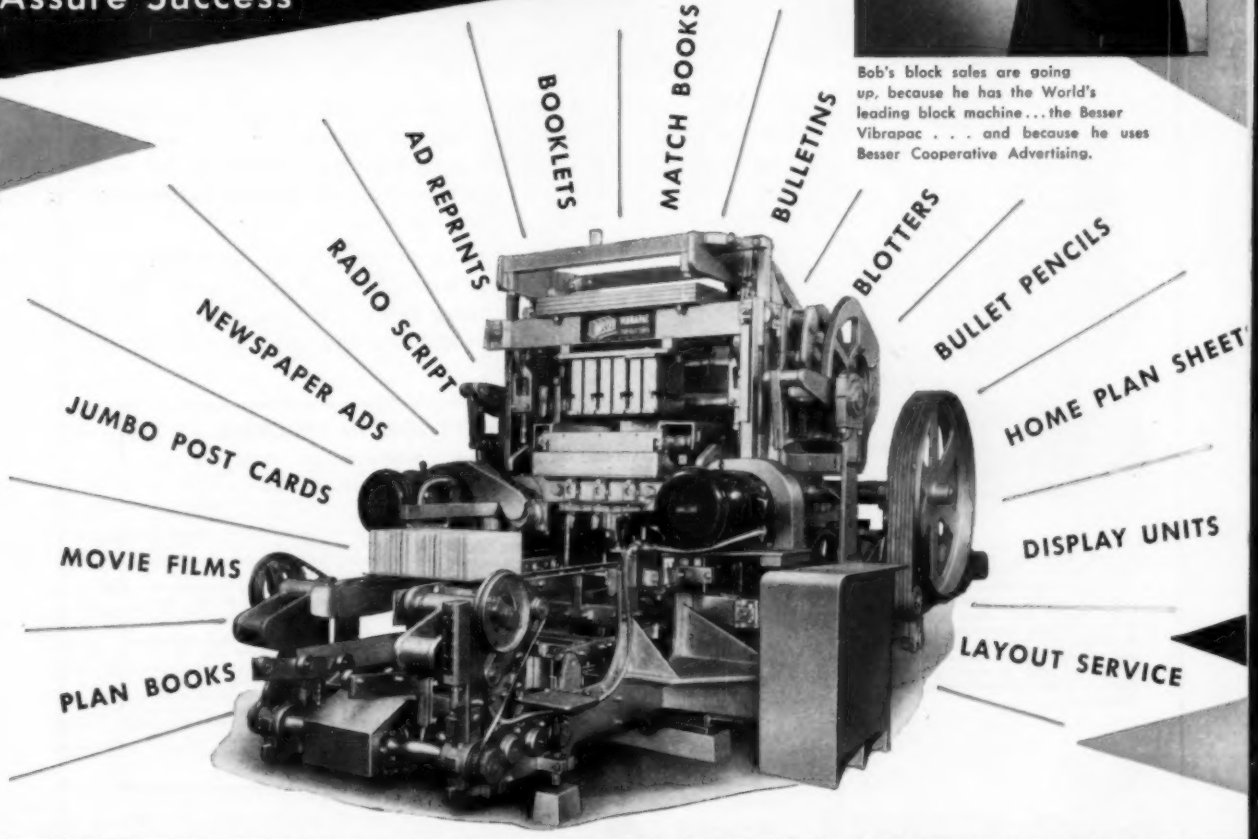
You not only want to *produce* more block — you want to *sell* more block, at a profit. Besser helps you to do *both*, by providing the World's leading block machine and a complete assortment of "sales tools". Many sound advertising and merchandising aids to sales are offered in the new Besser Cooperative Advertising Manual — sent FREE to all VIBRAPAC Block Plants. If you have not already received your copy — write for it today.

BESSER National Advertising Stimulates Demand for Block

Besser advertisements in practically all architectural and building publications are winning public acceptance of concrete masonry as a modern building material. This extensive and continuous promotional campaign is building a solid foundation for progress for all VIBRAPAC Block Plants.

Bob's block sales are going *up*, because he has the World's leading block machine . . . the Besser Vibrapac . . . and because he uses Besser Cooperative Advertising.

Besser Vibrapacs Assure Success



BESSER COMPANY

BOX 131 • ALPENA, MICHIGAN, U. S. A.

Complete Equipment for Concrete Block Plants

A 8426-1PBC

When increased demand makes plant expansion necessary...

design with Fanning-Schuett

CORSON CONCRETE COMPANY, Plymouth Meeting, Pa., is expanding its plant with an additional large storage bin and an additional mixer and batching facilities to meet the expanded demand for central mix in the Plymouth Meeting - Norristown area. The present belt conveyor will serve both storage bins by the addition of a short return belt conveyor for the second bin. Another Fanning-Schuett plant addition.

The problem of providing enough cement and concrete for the tremendous building program of our ever-growing economy has focused attention on the need for plant expansion. All over the country concrete plants are turning to Fanning-Schuett for economical additions to existing facilities.

For new plants as well as these expansions, there is a good reason for designing with Fanning-Schuett. Almost a half-century of experience has given Fanning-Schuett a "know-how" which means top efficiency in cement and concrete handling and storage equipment.

MAINE CEMENT PRODUCTS COMPANY, INC., Portland, Maine. A complete new plant is being designed and built for this rapidly growing company to produce concrete blocks and other products for the Home Building Program. Included in the plant are five storage bins for aggregates; one storage bin for cement; and handling equipment such as machinery for handling cement, screw and belt conveyors and two elevators.

FANNING-SCHUETT JOBS IN PROGRESS

SUPER CONCRETE CO., INC., Cumberland, Maryland. This company is building a whole new plant for ready mix concrete and manufacture of blocks. They have outgrown their original plant and are now laying out a new plant.

CONCRETE PRODUCTS COMPANY, Shippensburg, Penna. This company manufactures concrete blocks and other building products and is now converting to handle bulk cement. They are installing an unloading screw conveyor and elevator, a storage bin for 400 barrels, a screw conveyor and automatic controls for scale equipment over the mixer.

RIDGE CONCRETE, INC., Bartow, Florida. The ready mix concrete plant of this company is being expanded, and they are also installing block-making equipment for which they have purchased storage bins and an extension of their present belt conveyor system.

McDERMITT BROS. READY MIX CONCRETE, Gettysburg, Penna. This company is prominent in the Gettysburg area and has been in the ready mix business for many years. They have just made a large installation at Union Bridge, Maryland, to supply ready-mix concrete for the expansion of the facilities for the Lehigh Cement Co. They have also made a complete setup for handling of aggregates including elevators for sand and stone and a bulk cement handling outfit.

GELBMAN, INC., EXPANDED AGGREGATES CORP., New York City N. Y. This company is starting to build a complete plant for manufacturing light weight aggregates from slate wastes. They will install rotary dryers, belt conveyors, crushers, mixers, etc., to make a complete plant for the manufacture of light weight aggregates by sintering.

FANNING-SCHUETT ENGINEERING COMPANY
4325-39 NORTH THIRD STREET PHILADELPHIA-PENNSYLVANIA

ERIE STRAYER BATCH PLANT CUTS COSTS 20% FOR DIXIE CONCRETE PIPE COMPANY, NASHVILLE, TENN.

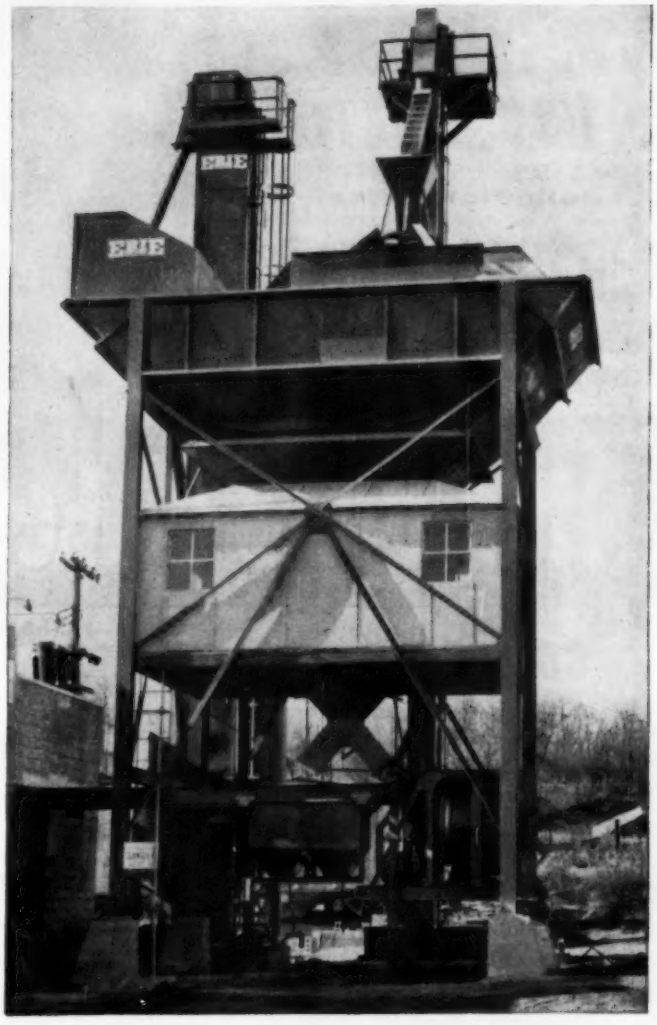
•

"Also Gives Us a Better Product"

SAYS E. C. RODGERS, PLANT MANAGER

•

Just one man mixes all the concrete needed to keep Dixie Concrete Pipe's equipment humming. An electrically-powered, mixed concrete hopper with remote control places mix in pipe machines. Plant will meet future needs of a pre-cast products casting yard also. Sold by Industrial Tractor and Equipment Company, Nashville.



DIXIE CONCRETE PIPE COMPANY, Nashville, supplies a large part of the concrete products for the busy Middle Tennessee area. This includes the pipe for Nashville's new sewage disposal system and T. V. A. Consequently, their pipe casting and block machines must keep up steady, swift production of quality products.

Until recently, Dixie Concrete bought their cement in bags. But last year, plant manager Rodgers, plant superintendent, W. J. Finney, and office manager, Wayne Harper decided they could effect a considerable savings by using bulk cement. Not only would they reduce the initial cement cost, but they would also save on freight, handling and materiels loss.

They looked over the plant suppliers—they bought an Erie Strayer Concrete Product Plant. Superior design, better engineering, and Erie Strayer's national reputation are the factors that sold them.

Whether you sell concrete or concrete products, before you buy, consider these proven advantages of Erie Strayer Plants:

1. Fast, economical erection.
2. Efficient design. Bins and batching equipment precision-engineered throughout.
3. Easy-to-reach, easy-to-work controls.
4. Greater production from faster batching and discharging cycle.
5. One-man operation.
6. Greater durability—standard, easily replaced parts.

Erie Strayer Central Mixing Plants feature the same fine engineering and money saving advantages.

For literature, write Dept. C-95

Cable Address: EXIMPORT

ERIE STRAYER COMPANY

395 GEIST RD. ERIE, PENNSYLVANIA

QUALITY...
PLUS VERSATILITY!

... dollar for dollar

STEARNS SERIES 50

(THE BIG 3)* gives you more!

- FASTER PRODUCTION
- EVEN TEXTURED BLOCKS
- LONGER MACHINE LIFE
- LOWEST MAINTENANCE

...the BIG 3* makes all three!

COMPARE! BEFORE YOU BUY

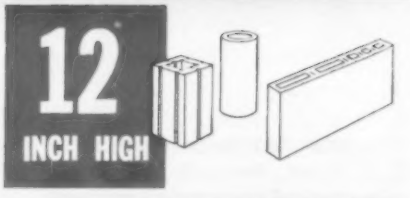
After you buy, your investment is protected only by the QUALITY of blocks you produce. STEARNS SERIES 50 assures you that quality, *plus* versatility . . . a built-in feature. No added investment for a *special* machine for 12", 8", or 4" high units. Stearns positive cam and roller cycle . . . uni-directional vibration and rugged, extra strength machine construction is a combination that guarantees you top production of the highest quality, even textured, well compacted units . . . every cycle, regardless of type . . . without guesswork or gadgets, eliminating costly down time. *Check and Compare!* We invite your comparison to *any* machine in the Series 50 price class for . . . actual machine weight . . . accessibility . . . quality of materials used in construction . . . for stamina, long life . . . low up-keep, and uppermost . . . *DEPENDABILITY!* ASK ANY OWNER!

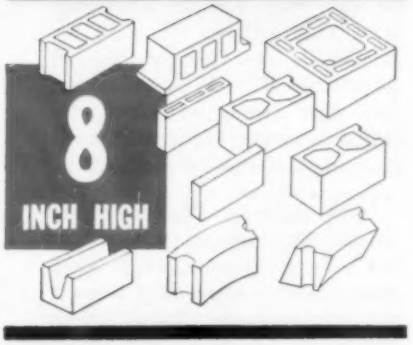
***THE BIG 3**

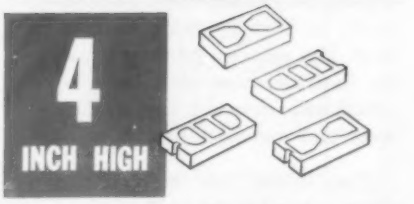
Model 50-3 makes three 8" x 8" x 16" or equivalent units per cycle. Maximum size pallet, 5/16" x 18½" x 26".

Model 50-2 makes two 10" x 8" x 16" or equivalent units per cycle. Maximum size pallet, 5/16" x 18½" x 20½".

Model 50-1 makes two 8" x 8" x 16" or equivalent units per cycle. Maximum size pallet, 5/16" x 18½" x 18½".







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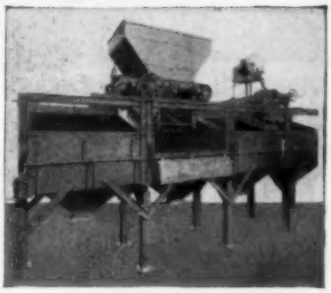

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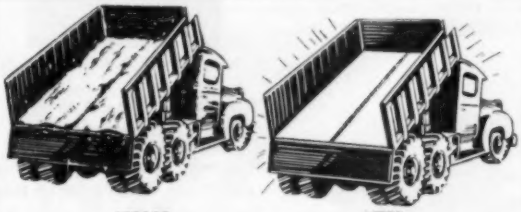

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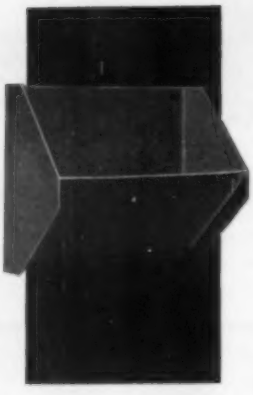
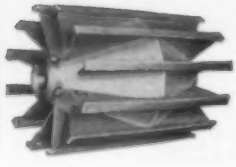


Standard Wing Type Self-Cleaning Pulley



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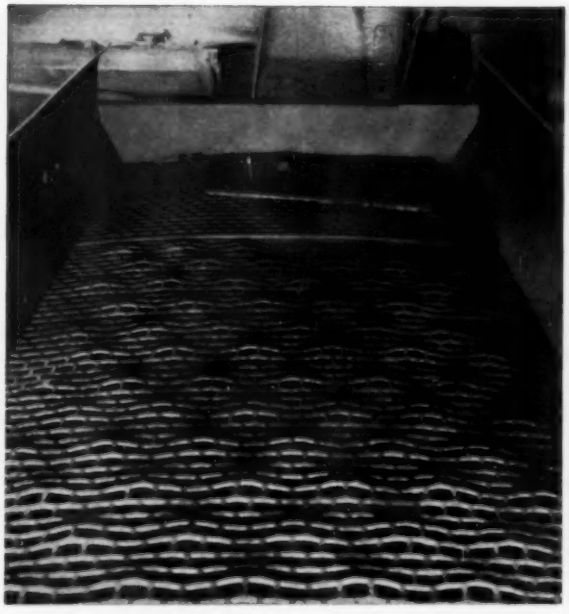

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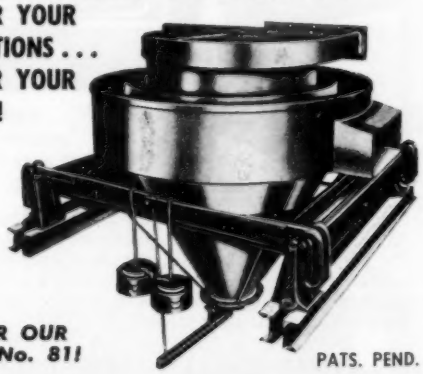

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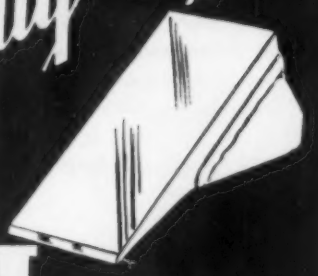

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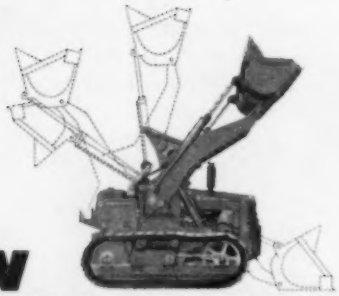

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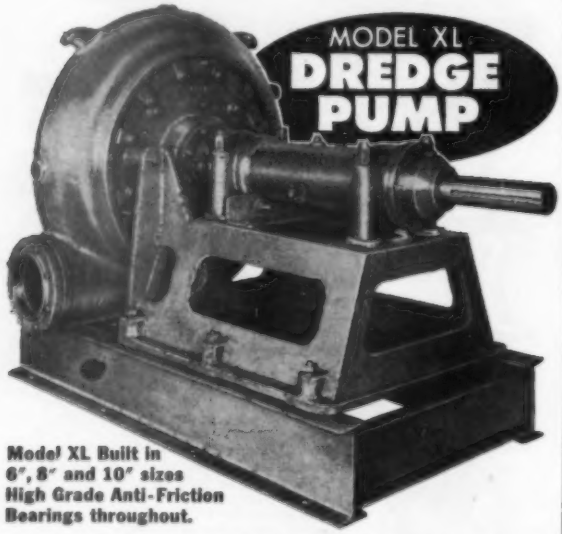

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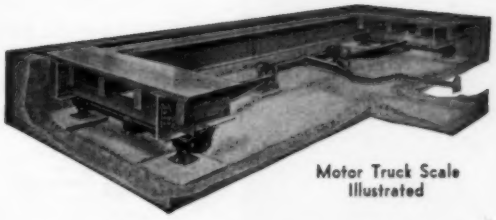

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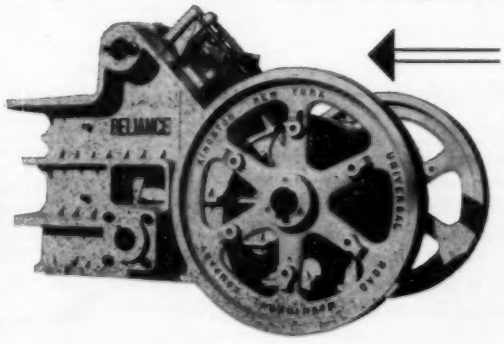

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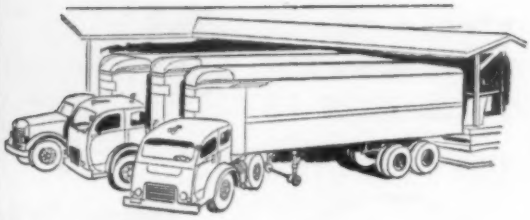

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ROTARY KILNS: 4'x28', 6'x28', 4'x42', 6'x8'x60', 8'x125', 3—9'x80', 4'x29', 6'x8', 6'x7'x80' 8'x125', 2—7'x110', & 3—9'x80'
ROTARY DRYERS: 3'x26', 4'x20', 4'x40', 5'x35', 6'x40', 6'x80', 11'x75', 4'x29', & 90"x60'.
2—7'6"x55'xA14 Ruggles Coles, 2 shell.

JAW CRUSHERS

BLAKE TYPE—66x84, 40x48, 42x48, 48x60, 24x36, 18x36, 15x30, 13x30, 12x24, 12x16, 10x20, 30x42.
SINGLE SHAFT—18x36, 15x26, 15x30, 10x46, 10x20, 10x20.
CAM & ROLLER—24x40, 14x26, 11x26, 10x20, 6x20.

GYRATORY FINE REDUCTION CRUSHERS

NEWHOUSE 7", 10", 14"—KENNEDY 198, 258, 37—SUP. McC. 6" & 10" AL. CHAL. 222R, TRAYLOR TY 36".

GYRATORY STD. PRIMARY CRUSHERS

6", 10", 14", 16", 20" & 36" SUP. McC.—GATES AL. CHAL. 3, 4, 5, 6, 7½, 8, 9, 12K.
PARTS FOR 42" SUPERIOR McCULLY.

27 VIBRATING SCREENS

NIAGARA AC—ROBINS—LINK BELT—2x5, 2x8, 2x8, 3x10, 4x5, 4x8, 4x10, 4x14, 4x16, 5x8, 5x10 & 5x14, 1-2-3 & 4 Decks.

1500 NEW 42 IN. IDLERS

1500 Conveyor Co. Trough. & Returns.

LOCOMOTIVES

25 Ton G.E. Diesel Elec.
4—125 Ton G.E. Diesel Elec.
2—16 Ton & 10 Ton Plymouth Diesels.
1—65 Ton & 5—45 Ton G.E. Diesel Elec.
10 TON DAVENPORT & 25 Ton Plymouth Gas
3—14 Ton Brookville Diesels. Also 10 Ton Diesel.
8—PLYMOUTH GAS. 6 - 8 - 10 TON.
22—BATTERY & TROLLEY, 4, 6, 8, 10 TON.

LOCOMOTIVE CRANES

30 TON OHIO STEAM, 50 FT. BOOM.
25 TON AMER.—30 TON OHIO DIESELS.

MERRICK WEIGHTOMETERS

7—42 In., 30 In., 24 In., 18 In.

STEEL DERRICKS

GUY: 2 TON 85 FT. BOOM, 25 TON 80 FT. BOOM, 15 TON 100 FT. BOOM, 20 TON 115 FT. BOOM, 50 TON 100 FT. BOOM.
STIFF LEG: 5 TON 70 FT. BOOM, 15 TON, 100 FT. BOOM, 25 TON 100 FT. BOOM, 75 TON 135 FT. BOOM. 1—5 TON 100 FT. BOOM.

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15—8,000, 10,000 & 20,000 GAL. CAP. WITH COILS. 6—10,000 GAL. R.R. CAR TANKS.

RAILWAY CARS

177—DUMP STD. GA.—20, 16, 12, 6 & 4 YD.
36—FLATS—10 TON, 40 TON, 50 TON CAP.
44—TANK CARS—8,000 & 10,000 GAL. CAP.
75—V Dump Cars, 1½ & 2 Yd.

R. R. CAR DUMPER

150 TON CAP. STD. GA. CAR DUMPER.

AIR COMPRESSORS—ELECTRIC

193, 420 & 676 WORTHINGTON BELTED.
1302 CFM & 1574 CFM INGER. RAND PRE-2.
1170 CFM GARDNER DENVER HAE1034-2300 V.
1578 & 2200 CFM—OCE—CHGO. PNEU. ELEC.
3078, 3864 & 5040 CFM Inger. Rand.

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CLYDE HYDRATOR WITH KUNTZ CONTINUOUS DUSTLESS SYSTEM. 4-5 T.P.H.

42" CONVEYOR EQUIPMENT

42"x58' Stacker Conveyor.
8—Conveyors, 42", 500' to 900'.
2000' Extra New 42" Idlers.
4000' Extra New 42" Belt.

R. C. STANHOPE, INC.
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ESCO 5 yard medium weight (perforated) dragline bucket serial #2595 complete with fittings.
Practically new $1,500.00

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Very good $1,250.00

ESCO 4½ yard medium weight (solid) dragline bucket serial #2770 complete with fittings.
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New — Sacrifice $1,500.00

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Marion 43-M Crane & Drag. New, never used. $6000 under list price.

Barber Greene portable Dryer in new condition, size 3' x 11'.

Barber Greene Model 82-A Bucket loader.

N.W. #6 Shovel & N.W. 80-D Shovel.

Lorain 820 Shovel.

2—Lorain 1½ c.y. shovel buckets in like new condition.

AIR COMPRESSOR RENTAL CO.
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WANTED

36" Bonnot Pulverizer,
Screen Top.

THE GIBSONBURG LIME PRODUCTS CO.
GIBSONBURG, OHIO

FOR SALE

HAMMERMILL S-6 Pennsylvania.

CRUSHER SHAFT and bearing assembly for 1540 Champion Good Roads Jaw Crusher.

GAS PRODUCER capacity 6,000 lbs. of coal per hour.

G. & W. H. Corsen, Inc.
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KILNS—DRYERS—COOLERS

1—11' x 330', ¾" shell.
1—11' x 10' x 235', ¾" shell.
2—8' x 125', ¾" shell.
1—8' x 72', ¾" shell.
1—7'6" x 110', ¾" shell.
1—7'6" x 7' x 125', ½" shell.
1—7' x 120', ¾" shell.
1—7'5" x 20'20" Link Belt, Roto-Louvre.
1—5' x 67', 5/16" shell.
1—5' x 40', ⅜" shell.
1—5' x 30', 7/16" shell.
1—4'6" x 50', ⅜" shell.

CRUSHERS—PULVERIZERS—MILLS

2—Allis Chalmers 10" Superior McCully.
1—Allis Chalmers k-9 Gates Gyratory.
10—Jaw Crushers, 5" x 6" to 42" x 48".
3—Symons Cone, 4', 3', 2'.
1—Williams 4 Roll High Side Mill.
1—Raymond 4 Roll Low Side Mill.
2—Pennsylvania #SXR-100, 100 TPH.
3—Hardinge 5' x 22", 6' x 22", 10' x 48".
3—Patterson 6' x 8' Ball Mills.
1—Raymond #40 Imp.
1—Williams #20 H.O. Slugger Hammermill.
2—A.C. 6' x 22' Tube Mills, 300 HP motors.
1—Allis Chalmers #8722 Compeb Mill.

SCREENS—SEPARATORS

6—Tyler Hummer Screens 3' x 5', 4' x 5', 4' x 7'.
1—Link Belt 3' x 8' double deck Screen.
5—Rotex 40" x 84", 40" x 120".
4—Air Separators, 6', 8', 10', 14'.

MISCELLANEOUS

2—Chicago 14" x 7" Compressors, 434 cfm.
2—Oliver Rotary Dewaterers, 8' x 4'.
12—Bucket Elevators, 20' to 75' centers.
250 ft. Link Belt 12" Troughing Conveyor.
800 ft. 30" Troughing Conveyor.
1—10,500 gpm Centrifugal Pump, 135' head.

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GIBSON FORK LIFT

Serial #15-193-51 Model GF 15-3513
Capacity—15,000#
Tires—Pneumatic 8:25/15 duals in front, single rear
Engine—6 Cylinder gasoline
Load Center—24"
Lift—210"
Fork—48" long
Price—$2,250.00 FOB Cleveland, O.

TESTA BROS., INC. **RICHMOND ROAD**
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Conveyor equipment, would like to buy Approx. 3000 ft. of 36" and 2000 ft. of 24" used conveyors direct from former user. Will consider purchase of smaller amount in large quantity. Write telling whether we can inspect.

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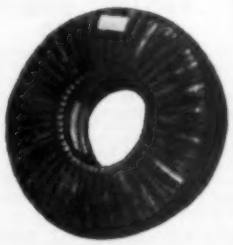
Mitco Tires will give you trouble free performance by eliminating tire repairs, tube repairs, tire changing, and work stoppage. Recommended for use on all equipment using pneumatic tires. Unique construction of Mitco Tires makes punctures, blowouts, deflation IMPOSSIBLE!



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BUCYRUS ERIE 42T Blast Hole Drill, diesel powered with B-E #12 Bit Dresser, complete, with extra tools bits, stems, etc. New 1950 and used 2 seasons $16,500 Yard.

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UNIVERSAL Secondary Portable Plant w/4x12 2-deck Simplicity Screen, Buda 844 DC power unit, 30x18 rb. rolls, #3 hammermill, conveyors, mount-ed tandem pneu. axles. Bargain. $10,000.

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PIONEER Portable Gravel Plant w/9x36 Jaw, 30x18 rb. roll, 42"x14' 2-deck Symons screen, 24" belts, mounted tandem frame. Bargain. $4250 Minnesota.

WASHING PLANT, 35 yds. per hr. with conveyors, rotary scrubber, steel bins, etc. Good. $6500.

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ROGERS 10x18 Jaw Crusher, like new. $400 Yard.

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25 to Ind. Brownhoist Diesel Loco. Crane.

65 ton Porter Diesel-Elec. Locomotive.

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140 HP Christian 2D Diesel Hoist & Swinger.

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Koehring 1005 Diesel Crane 2½ yd. 1952.
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2200 CFM C-P OCE Air Compr. 350 HP.

160 HP Caterpillar D-17000 Diesel Unit.

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1—Jeffrey Swing Hammer Pulverizer direct connected to 75 H.P. T.E.F.C. Westinghouse motor, 1200 r.p.m., size 36"x30", type A2, ball bearing, in good condition.

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1 - LETOURNEAU Model Super C Tournadozer, mounted on 21 x 25 - 16 ply tires and powered with a factory new GM-6-71 diesel engine $10,000.00

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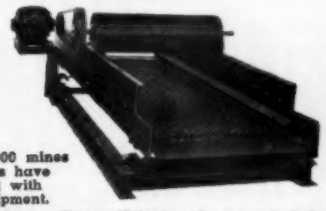
BONDED EQUIPMENT BARGAINS

WRITE, WIRE OR PHONE - IMMEDIATE SHIPMENT FROM OUR FACTORY

NEW BONDED® HEAVY DUTY VIBRATING SCREENS

"For Continuous, Economical Screening of High Tonnages"



More than 5000 mines and quarries have modernized with Bonded equipment.

For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry. HEAVY DUTY MODELS: 4-bearing, positive throw, eccentric shaft; 3'x8' to 5'x14', 1 to 5 decks. TYPE A SCREENS: eccentric weight mechanism, spring mounted, 1 to 3 decks, 2'x4' to 3'x8'. Write for Bulletin 1086 & 1087.

Heavy Duty Screens from.....$1095.00 **General Purpose Screens from $395.00**

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Complete Ready-Fab sections quickly and easily joined together on the job. We take our loss on our stock of short length belting. You can save as much as 50% on the BONDED CONVEYOR SPECIALS listed, with conveyor belting in two pieces. Conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2¼" or 2-7/16" diam. shaft. Belt is new 4-ply, 28-oz. duck, ⅛" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

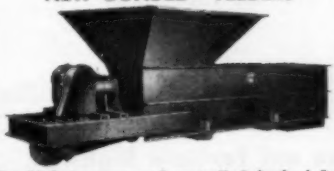
Remember, You Save Up To 50%

CONVEYOR PRICES INCLUDE BELTING

Belt Width	Length of Conveyor	List Price	Sale Price
14"	25'	$1080	$ 622
14"	50'	1830	985
16"	20'	991	548
16"	45'	1785	937
16"	60'	2309	1170
16"	85'	3102	1558
18"	25'	1229	684
18"	45'	1839	1005
18"	60'	2384	1254
18"	85'	3209	1665
18"	100'	3704	1912
20"	25'	1285	713
20"	45'	1965	1060
20"	60'	2490	1320
24"	25'	1322	773
24"	45'	2062	1145
24"	60'	2617	1434
24"	100'	4097	2186
24"	130'	5207	2773
30"	25'	1421	847
30"	65'	3101	1718
30"	85'	3731	2144

Other lengths & belt widths at bargain prices.

NEW BONDED® FEEDERS



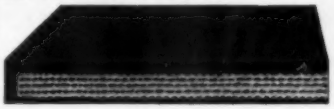
For high tonnage and controlled feed of Aggregate, Sand, Gravel, Crushed Stone, Clay products, Metallic Ores, Coal, Cinders and almost any other bulk material to Crushers, Screens, Conveyors, Mills and other process machinery. Feeder may also be driven from tail shaft of Bonded® Troughing Idler Conveyors thus eliminating the necessity of two motors. Capacities to 60 tons per hour. Larger models available to 225 tons per hour.

Priced from $280.00

NEW CONVEYOR BELTING

SAVE UP TO 28%

Heavy duty 4-ply, 28 oz. duck, 1/8" top rubber cover x 1/32" bottom cover rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.

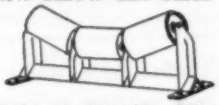


Width	List Price	Sale Price
14"	$3.23 foot	$2.50 foot
16"	3.64 foot	2.62 foot
18"	4.03 foot	2.90 foot
20"	4.42 foot	3.35 foot
24"	5.23 foot	3.76 foot
30"	6.39 foot	4.60 foot

Additional widths and plies available at low prices. Write for free sample.

NEW IDLERS & RETURN ROLLS

25% BELOW LIST PRICE



3-roll, 5" diameter Troughing Idlers for

14" belt	$16.50	24" belt	$18.75
16" belt	17.25	30" belt	19.50
18" belt	18.00	36" belt	20.25
20" belt	18.25	48" belt	21.75

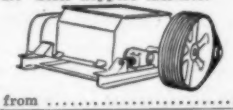
1-roll, 5" diameter Return Idlers for

14" belt	$6.38	24" belt	$7.50
16" belt	6.75	30" belt	8.25
18" belt	7.13	36" belt	8.75
20" belt	7.30	48" belt	10.25

All steel. Interchangeable with other well-known makes. Replaceable ball bearings. Either sealed type (pre-lubricated) or with alemite fittings. Rust proof ball races. Maintenance is negligible.

NEW BONDED® CRUSHERS

Bonded double roll crushers for crushing Lightweight Aggregate, Pumice, Perlite, Chemicals and similar materials. Capacities to 100 tons per hour. Steel hoppers included.



Priced from $479.00

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Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders
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190-B B-E 8 yd. electric shovel
170-B B-E 6 yd. electric shovel
Lima 2400 6 yd. diesel shovel
Lima 1201 3½ yd. diesel shovel
54-B B-E 2½ yd. diesel shovel
37-B B-E 1¼ yd. diesel power
625 Page diesel walker 9 yd. 150' boom
9-W B-E electric walker 8 yd. 200' boom
2400 Lima 5 yd. 130' dragline
4500 Manitowoc 5 yd. 120' drag
618 Page diesel walker 5 yd. 125' boom
1201 Lima 85' boom 3 yd. drag-crane
3500 Manitowoc 2½ yd. 85' drag
95 Northwest 2½ yd. 70' diesel dragline
955 P&H 85' boom 2½ yd. diesel dragline
2000 Manitowoc 1½ yd. diesel shovel
K-480 Link Belt 80' 2 yd. diesel crane-drag, independent boom hoist
604 Lima 65' boom 1½ yd. diesel dragline
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255 PC J&H 20-ton truck crane 80' folding boom, 30' jib
Model 25 Northwest truck crane
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2—DW-10 Tractors and 12 yd. Athey side dump wagons
2—520 GarWood 18 yd. scrapers

Many Good Used Trucks

FRANK SWABB EQUIPMENT CO., INC.
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WANTED: USED MACHINES OR ENTIRE PLANT

Including Rotary Dryers and Kilns, Raymond Mills, Symons Cone Crushers, Ball Mills, Vibrating Screens, Mikro Pulverizers, large Filter Presses, Power Shovels and Cranes, Bucket Elevators, Simpson Mixers, Diesel Engines.

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FOR SALE

Allis-Chalmers 42" x 16" Style B roll-crusher, complete with motors, starters, drive, everything. Less than 100 hours use. Price $8500.00 complete, where is, as is.

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WANTED

Caterpillar and General Motors Diesel Engines & Parts. All Model Waukesha Gas Engines and Parts.

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3042 Buchanan jaw, never assembled, approx. $4,000 parts missing, $5,700 — 8466 Allis-Chalmers jaw with motor — 3' Symons std. and shorthead — A-C Sup. McCully 30" — 12K Gates — 5424 Pioneer triple roll new cost $27,000, used two seasons, $9,350 — 5 x 14 Marcy rod mill, $5,750 — Three 85 ton trolley locomotives, lot, $23,000 — Five NEW battery locomotives & 3 sets batteries, 35.4" ga., 10 tons, all for $37,000 — About 40 Koppel two-way side dump cars & 3 Plymouth gasoline locomotives, all 24" ga., all for $3,500 — Differential Electric Co. haulage equipment, including 4 locomotives with built-in side dump car and 17—130 cu. ft. air dump cars, std. ga. — Manitowoc 4500 dragline, $84,000 — Joy 56 blast hole drill — 78" & 48" spiral classifiers — Cedar Rapids AA 2223 primary plant, 1953, complete, $25,500.

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4—Compartment, 500 Ton Steel Bins.

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FOR SALE

400 Ft. Bucket Elevator Buckets 36x28x12, 600 ton per hour.
54x35 Atkins Classifier, 78x28½ Wemco Classifiers.
24x42 in. Lippmann Rolls, 24x36 Farrel Jaw Crusher.
1830 A-C Jaw Crusher, 1024 Lippmann R.B. Jaw.
5x16, 2 Deck Robins Screen.

WESTERN EQUIPMENT CO.
P.O. Box 391 • Phone 2-1743 • Kenosha, Wis.

WANTED Everything for new crushing and screening plant.
48"x60" Jaw Crusher, or 30"x40".
5½, 4 ft. Symons Cone or equal.
300 ft. 30" conveyor.
150 ft. 24" do.
40"x22" double roll.
5 ft. x 14 ft. 2-deck screen.
4 ft. x 10 ft. do.

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FOR SALE

1½ Yard Sauerman

Slackline Cableway

With 100 Ft. Steel Tower in good working shape, with Westinghouse Motor, Type C-1 or C-11, Induction Motor, 125 H.P., 3 Phase, 60 Cycle, 550 Voltage, 690 RPM under load with starter forward and reversible. We will sell this equipment for the highest offer received by October 1, 1955.

***Contact* Richard H. Pennell**

Pennell & Harley,

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Track Accessories
All prices cheerfully quoted.

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MARION Model 93M, Serial #9676
Caterpillar D17000 Diesel Engine
Air Controls — 20 ft. Crawlers,
36" Treads, 70 ft. boom
3 Yd. Hendrix Bucket
Machine purchased new 1952
Never worked over 8 hrs. per day
Very Good Condition

RENTAL OR RENTAL PURCHASE
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100 Ton Guy Derrick, elec. hoist.
65 Ton Diesel-elec. Std. Ga. Loco.
2/drum Hoist; 9 ton @ 200 FPM; 3/60/2200/585 RPM.
100 Ton Derrick Car; steam, 50 ton—40'; 15 ton—85'.

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ED. WEBER
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REliance 5-2889

FORCED SALE: Must move out for new highway

20x36 Cedar Rapids ball bearing jaw crusher	$4500
36"x6'6" C-R heavy duty crusher feeder	900
30x18 C-R two-roll crusher	2000
9x36 C-R jaw crusher	1000
3'x8' Tyler-Niagara 3 deck screen	750

This equipment is nine years old, in actual operation now. If take entire list will dismantle and load on flat car for $500 extra.

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FOR SALE

1—20-B Bucyrus-Erie ¾ yard Diesel operated shovel with coal loading bucket.
1—¾ yard Insley, Diesel operated shovel with coal loading bucket.
1—Syntron Type F-55, 4' wide x 6' long Electric Vibrating Feeders for 440 volt, 60 cycles, 20 amperes.
3—48" x 14'-0" Syntron Double Deck Screens without motors.

The above equipment is priced to sell.
Contact Blue Grass Minerals, Inc., Pineville, Kentucky
Phones: Edgewood 7-2381 or Edgewood 7-2062

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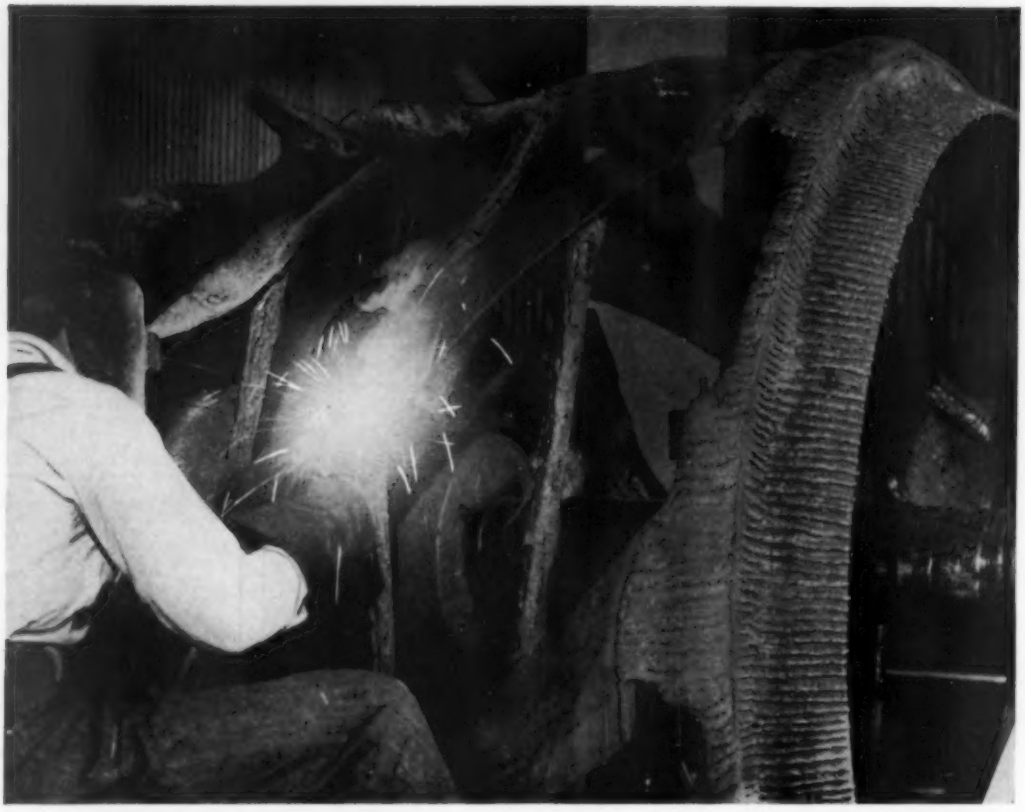

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INDEX TO ADVERTISERS

A A Wire Products Co. 257
Adams Division, LeTourneau-Westinghouse Co. 211
Admiral Alloy Steel Corp. 273
Ajax Flexible Coupling Co., Inc. 28
Albemarle Paper Mfg. Co. 143
Allied Chemical & Dye Corp. Solvay Process Div. 268
*Allis-Chalmers Mfg. Co. 6, 122-123
*Allis-Chalmers Mfg. Co., Tractor Div. 149
Aluminum Industries, Inc. 259
American Air Compressor Corp. 285
American Brake Shoe Co. 137
American Cable Division, American Chain & Cable Co., Inc. 59
American Clay Machinery Div. of Huber-Warco Co. 249
American Crankshaft Co. 284
American Cyanamid Co. 121
American Hoist & Derrick Co. 169
American Manganese Steel Div. American Brake Shoe Co. 172, 286
*American Steel & Wire Div., U. S. Steel Corp. 26-27
Armstrong-Bray Co. 277
Athey Products Corp. 198
Atlas Powder Co. 165
Austin-Western Company 183
Autocar Division, White Motor Co. 181

*Babcock & Wilcox Co. 171
*Bailey Meter Co. 203
Baldwin-Lima-Hamilton Corp. Construction-Equipment Div. 183
*Barber-Greene Co. 127
Bay City Shovels 148
*Bemis Bros. Bag Co. 161
*Bergen Machine & Tool Co., Inc. 231
*Besser Co. 214, 263, 266, 269
*Bethlehem Steel Co. 205
*Blaw-Knox Co. 243
*Blower Application Co. 277
Bonded Scale & Machine Co. 281
Brill Equipment Co. 280
Broadcast Section 279-285
*Brunner & Lay, Inc. 174
Bucyrus-Erie Company 131
*Buell Engineering Co., Inc. 185
*Burmeister Co. 222

C & W Sales Co. 223
*Calumet Steel Castings Corp. 276
Cape Ann Anchor & Forge Co. 182
Carlyle Rubber Co., Inc. 283
Carpenter Manufacturing Co. 260
Caterpillar Tractor Co. 67-68-69-70
Chase Bag Company 112
Chase Foundry & Mfg. Co. 260
Chicago Pneumatic Tool Co. 20
Chrysler Corporation Industrial Engine Div. 41
Cities Service Oil Co. 71
Clark Equipment Co. 227
Cleveland Vibrator Co. 172
Cleveland Wire Cloth & Mfg. Co. 177
Cleveland Worm & Gear Co. ....Inside Back Cover
Clipper Mfg. Co. 259
Colorado Fuel & Iron Corp. 38, 81
Columbia Machine Works 245
*Combustion Engineering, Inc. Raymond Division 196
Concrete Manufacturer Classified Section 264-265
Concrete Post Form Co. 260
*Continental Gin Co. 151
Cook Bros. Equipment Co. 221
Courchesne, Inc. A. 282

Darden Industries, Inc., Roy 234
*Deister Concentrator Co. 188
*Deister Machine Co. 9
Dempster Brothers, Inc. 146
Des Moines Glove & Mfg. Co. 262
Detroit Diesel Engine Div. General Motors Corp. 14-15
*Diamond Iron Works, Inc. 178
Dodge Manufacturing Corp. 8
Dow Chemical Co. 225
Drott Mfg. Corp. 163
Dunn Mfg. Co., W. E. 229
Du Pont de Nemours & Co., E. I., Inc. 97
Durkee-Atwood Co. 275

*Eagle Crusher Co. 102
*Eagle Iron Works 23
*Easton Car & Construction Co. 3
*Eaton Mfg. Co. 147
Economy Forms Corp. 256
Edmont Mfg. Co. 266
Ehrsam & Sons Mfg. Co., J. B. 259
Eimco Corporation 11
Ensign-Bickford Co. 105
Equipment Corp., of America 284
Erickson Power Lift Trucks, Inc. 262
*Erie Strayer Co. 271
*Euclid Division, General Motors Corp. 90

*Falk Corporation 57
Fanning-Schuett Engrg. Co. 270
Faris-Moritz Equipment Co. 280
*Farrel-Bacon 107
Fiske Brothers Refining Co., Lubriplate Division 168
*Fleming Mfg. Co. 220
Frank, M. E. 282
Frog, Switch & Mfg. Co. 188
*Fuller Co. 242

Galion Allsteel Body Co. 273
Gar Wood Industries, Inc. 200
Gates Rubber Co. 66
General Cable Corp. 155
*General Electric Co. 72-73
*General Motors Corp. 14-15, 90
Goodyear Tire & Rubber Co. 1
Griffin, Larry 264
Gulf Oil Corp. 55

H & L Tooth Company 276
Hamilton Rubber Co. 44
Hannon & Sons, F. D. 166
*Hardinge Company, Inc. 170
Harnischfeger Corporation 189
Haverstick Bros. 267
Hazard Insulated Wire Works, Div. of The Okonite Co. 153
Heidenreich, E. Lee, Jr. 279
Heineken, Inc., W. P. 285
Heltzel Steel Form & Iron Co. 240
*Hendrick Mfg. Co. 275
Hendrix Mfg. Co. 118
*Hercules Motors Corp. 173
Hetherington & Berner, Inc. 274
*Hewitt-Robins, Inc. 91
Hobbs Manufacturing Co. 120
Hoffman Bros. Drilling Co. 208
*Hoffmann Co., Geo. W. 265
Hogan, Charles H. 283
Hough Co., Frank G. 119
Hoyt Wire Cloth Co. 40
Huber Corp., J. M. 285
Huber-Warco Co. American Clay Machinery Div. 249
Hughes Tool Co. 33

Ideal Engineering Co., Inc. 265
Industrial Brownhoist Corp. 115
International Harvester Co. Drott Shovels 163
International Harvester Co. Industrial Power Div. 47
International Nickel Co. 199
International Paper Co., Bagpak Division ....Inside Front Cover
*Iowa Manufacturing Co. 135

Jaeger Machine Co. 233
Jeffrey Mfg. Co. 17
*Johns-Manville Corp. 54
Johnson-March Corp. 34
*Joy Manufacturing Co. 16, 274

Kaiser Aluminum & Chemical Corp. 43
Kansas City Hay Press Co. 276
*Kennedy Van Saun Mfg. & Engrg. Corp. 48-49
Kensington Steel Co. 65
Kent Machine Co. 219
Kirk & Blum Mfg. Co. 252
Koehring Co. 62-63
*Kraft Bag Corp. ....Back Cover

Laclede-Christy Company, Div. of H. K. Porter Company, Inc. 161
Lincoln Electric Co. 42
*Link-Belt Company 35, 159
*Link-Belt Speeder Corp. 53
Littleford Bros. 263
Lone Star Cement Corp. 210
Lubrecht III, William 284
Lubriplate Division, Fiske Bros. Refining Co. 168

Mace Company 273
Mack Motor Truck Corp. 175
Manhattan Rubber Div. Raybestos-Manhattan, Inc. 193
Manheim Mfg. & Belting Co. 167
Marion-Osgood-General 31
Marsh Engineering Co., E. F. 218
*McLanahan & Stone Corp. 60
McNamar Boiler & Tank Co. 78
*Meckum Engineering, Inc. 182
Medusa Portland Cement Co. 235
*Merrick Scale Mfg. Co. 188
Mid-Western Concrete Equipment Co. 265
Minneapolis-Moline Co. 7
*Morris Machine Works 176
Motorola Communications and Electronics, Inc. 201
Murphy Diesel Co. 30

National Conveyor & Supply Co. 258
National Wire Cloth Co. 261
*Naylor Pipe Co. 52
New York Trap Rock Corp. 283
Noble Company 212
*Nordberg Manufacturing Co. 18-19
*Northern Blower Company 187
Northwest Engineering Co. 5
Norwalk Vault Co. 263

Okonite Company 153
Olsen Corp., Gene 217
O'Neill, A. J. 285
Oronite Chemical Co. 241
Orton Crane & Shovel Co. 195
Oswalt Engineering Service Corp. 260

*Page Engineering Co. 109
Pennell & Harley, Inc. 282
*Pennsylvania Crusher Div. Bath Iron Works Corp. 4
Pennsylvania Drilling Co. 284
*Pettibone Mulliken Corp. 145
Phillips Co., The Thomas 36
Porter Company, Inc., H. K. 161
PreCaster, Inc. 223

Quinn Wire & Iron Works 267

Rankin Mfg. Co. 29
Raybestos-Manhattan, Inc. Manhattan Rubber Div. 193
*Raymond Bag Co. 77
*Raymond Div. of Combustion Engineering, Inc. 196
Reo Motors, Inc. 194
*Research-Cottrell, Inc. 108
Roebling's Sons Corp., J. A. 142

Salem Tool Co. 186
Sauerman Brothers, Inc. 180
Schaffer Poidometer Co. 184
Schramm, Inc. 157
*Screen Equipment Co. 117
Service Supply Co. 276
Servicised Products Co. 256
Shawnee Step Form Co. 267
Sheffield Steel Corp. 86
Side-O-Matic Unloader Corp. 261
Simplicity Engineering Co. 87
Sinclair Refining Co. 45
*Sly Mfg. Co., W. W. 191
*Smidth & Co., F. L. 160
Smith Engineering Works 39
*Smith Co., T. L. 247
Solvay Process Div. Allied Chemical & Dye Corp. 268
Southern Tire Co. 13
Spang & Company 85
Spencer Chemical Co. 116
Spillman Co., R. L. 265
Sprague & Henwood, Inc. 56
Standard Metal Mfg. Co. 274
Stanhope, Inc., R. C. 280
*Stearns Manufacturing Co., Inc. 272
*Stephens-Adamson Mfg. Co. 208
Stoody Co. 124
Straub Mfg. Co. 37
*Sturtevant Mill Co. 206
Surety Rubber Co. 261
Swabb Equipment Co., Inc., Frank 282
*Syntron Co. 92

Taylor-Wharton Iron & Steel Co. 32
Thew Shovel Co. 192
Timken-Detroit Axle Div. 88-89
Towmotor Corporation 216
*Traylor Engrg. & Mfg. Co. 51, 202
Trinity Div. General Portland Cement Co. 262
Truck Mixer Manufacturers Bureau 251
Truckstell Mfg. Co. 253
*Twin City Iron & Wire Co. 267
Twin Disc Clutch Co. 207
*Tyler Co., W. S. 174

United States Rubber Co. 179
*United States Steel Co. 26-27
*Universal Engineering Corp. 145
Universal Road Machinery Co. 277
*Universal Vibrating Screen Co. 184
Unverzagt & Sons, G. A. 283

Viber Company 254
Victor Equipment Co. 204

Webb Corporation 277
Wenzel Machinery Co. 281
Werd & Schaeffer Tire Co., Inc. 280, 283
Western Machinery Co. 197
*Western Precipitation Corp. 288
Wheeler Co., Inc. 267
White Motor Co., Autocar Division 181
*Wickwire Spencer Steel Div. Colorado Fuel & Iron Corp. 38
Williams, Roger F. 263
Willys Motors, Inc. 24, 25
*Wood Co., Chas. E. 275

Yellen, John J. 264
*Yuba Manufacturing Co. 190

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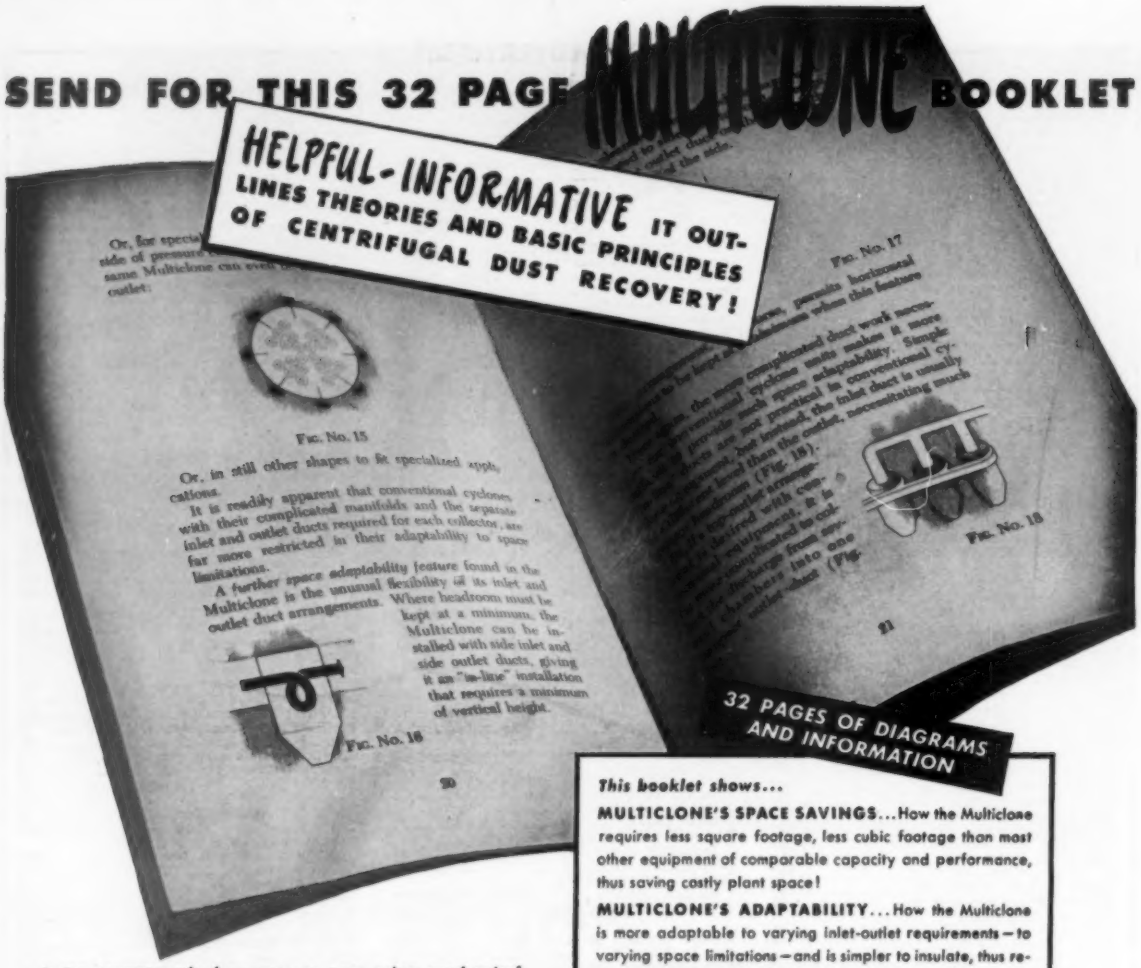

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Size 500FA Speedaire in a South Carolina clay products plant. Photo by courtesy of the Hardinge Company, Inc., York, Pa., builder of the Ruggles-Coles dryer.

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Wax Laminated Kraft	✓	
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Stak-LOK Super Rough Kraft	✓	
Valve Bags—sewn or pasted	✓	
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Flat Sewn Valve Bags	✓	
Flat Sewn Open Mouth Bags	✓	
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